DISSERTATION

WILDERNESS USER PREFERENCES FOR PSYCHOLOGICAL OUTCOMES AND SETTING ATTRIBUTES

Submitted by

Deborah J. Allen

In partial fulfillment of the requirements

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ABSTRACT OF DISSERTATION

WILDERNESS USER PREFERENCES FOR PSYCHOLOGICAL OUTCOMES AND SETTING ATTRIBUTES

A major focus of the behavioral approach to recreation research has been defining recreation opportunities that are desired by different groups of recreationists. Interest in this topic stems from the need to understand precisely what is produced on recreation lands so that effective planning and management will occur for present and future recreation areas. The steady increase in recreational use of wilderness areas over the past ten years has made understanding the components of recreation opportunities in wilderness areas imperative for planning and management.

The objectives of this research were to describe and quantify the desired psychological outcomes of wilderness users, describe the setting attributes facilitating desired wilderness experiences, and identify which attributes were most important to different types of wilderness users. A sample of 240 wilderness users from the Maroon Bells-Snowmass Wilderness in Colorado participated in this study.

A mailback questionnaire was used to collect data on users' preferences for psychological outcomes, setting attributes (physical, social and managerial), and demographic information. The fifty-one psychological outcome items were scored on a nine-point interval scale. The thirty-six setting attributes were grouped into six groups and scored using a ratio scaling procedure.

Cluster analysis procedures (ICLUST and NORMIX) were used to group respondents into types based on responses to the outcome items. This

analysis resulted in identifying four types of Maroon Bells-Snowmass Wilderness users. The one preference common to all four types was the rating of Relationships with Nature/Scenery as the outcome that added the most to their wilderness experience.

The smallest group of users (15 percent of the sample) were those who emphasized traditional wilderness values, such as privacy and introspection. This group was most dependent on the wilderness resource. The second group was a family oriented group who had preferences for a wilderness experience that was not dependent on the wilderness resource. The third and fourth groups of users valued the exercise-challenge aspect of the wilderness experience. Although these two groups valued similar outcomes, the third group scored their preferences for outcomes at a lower level than the fourth group.

This study showed that preferences for types (physical, social, and managerial) of setting attributes did not differ between the different types of Maroon Bells-Snowmass Wilderness users. All four types of users indicated that physical attributes were more important to them than the social and managerial attributes. This corresponds to the high rating of nature and scenery in the outcome items.

This was an exploratory study designed to identify components of the wilderness recreation experience and the recreational setting. A ratio scaling technique was used to identify the importance of different attributes of the recreational setting.

Deborah J. Allen
Department of Recreation Resources
Colorado State University
Fort Collins, Colorado 80523
Summer, 1979

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CHAPTER I

INTRODUCTION

Research in outdoor recreation has expanded from collections of demographic and activity participation data to studies of the social and psychological processes involved in selecting and participating in outdoor recreation activities. A major focus of the behavioral approach to recreation research in recent years has been defining recreation opportunities that are desired by different groups of recreationists.[1] Interest in this topic stems from the need to understand precisely what is produced on recreation lands so that effective planning and management will occur for present and future recreation areas.

More effective planning and management is recognized as being increasingly important for dispersed recreation opportunities because participation in dispersed recreation on National Forest lands has increased. Between 1968 and 1978 use increased 28 percent, with two-thirds of this use being for dispersed recreation (U.S. Dept. of Agric., 1968, 1978). Wilderness recreation has increased steadily over the last ten years. In 1978, National Forest Wilderness Areas received over 8.6 million visitor days of use (U.S. Dept. Agric., 1978). Also, one in five Americans believed that they have visited a wilderness area at

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[1] A recreation opportunity is the chance to engage in a particular recreation activity in a particular setting (or environment) to gain specific outcomes. It assumes recreationists have a preference for activities, setting and outcomes (Driver and Brown, 1978). Recreation opportunities are seen as the products of recreation management.

least once in their lifetime, whether they actually have or not (American Forestry Institute, 1977).

These changes in the use of National Forests and the need for balanced planning and management have required the development of new concepts for defining recreation products. The concepts that have been developed build on research completed and management concepts developed during the past twenty years. In the next few pages these concepts are reviewed to provide a managerial context in which to view the problem to be solved by this research.

The Product of Recreation Management

Understanding the product of recreation management (recreation opportunities) is essential to planning and managing the recreational resource. Efficient allocation of recreation resources cannot be made without comparable measures of value between the different products produced on recreation lands. Allocation decisions are more difficult in outdoor recreation management than other resource management areas because most outdoor recreation opportunities are non-market goods (consumers do not pay actual costs of producing the good). In other resource areas, demand is assessed in economic terms and allocations of resources are based on dollar values. In outdoor recreation management, demand for recreation opportunities can be partitioned into categories of demand.

There are four components of the demand for recreation opportunities (Driver and Brown, 1978). First, there is the demand for the opportunity to engage in particular activities. This has been the basis for

recreation planning and management in the past and, while still important, it provides an incomplete base on which to make management decisions.

Demand for the opportunity to engage in recreation activities in particular environmental settings is another component of recreation demand. Every recreation setting has particular attributes[2] that are desired by individuals. These setting attributes are identifiable (Haas, Allen, Manfredo, in press; Manfredo, Brown, and Haas, in press), and are an important component in assessing which recreation opportunities to provide in a recreation area.

The demand for the opportunity to realize particular psychological outcomes[3] from engaging in a recreation activity is the third component of recreation demand. Psychological outcomes realized from engaging in a recreation activity result in recreation experiences. It is here that quality of the recreation product can partially be assessed. The quality

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[2]Attributes of the recreation setting are specific features of the environment that enhance the realization of the reasons for engaging in particular activities (psychological outcomes). The recreation environment can be broken down into three attribute types: physical, social and managerial. Physical attributes are the descriptors of the natural environment such as rugged topography, slow moving streams, dense forests, etc. Social attributes characterize interaction with or indirect evidences of other people whom users meet while in the wilderness; e.g., meeting large-sized groups, camping near other parties, litter, etc. Managerial attributes are the policies that govern a recreation area and the physical manifestations of those policies on the ground, such as directional signs, designated campsites, reservation and fee systems, etc.

[3]Psychological outcomes are reasons or motives for engaging in particular recreation activities. These have previously been referred to in the literature as a "package of experiences" (Driver and Tocher, 1970) and as "multiple satisfactions" (Hendee, 1974). These outcomes will differ among recreationists. They are specific and immediately grafitying pleasures from certain aspects of recreational experiences (Hendee, 1974). Examples of outcomes are gaining self-realization, change of pace, risk taking, out-group affiliation and enjoying nature.

of recreation opportunities provided by management is measured by the degree of satisfaction realized by the recreationist (Havighurst, 1957; ORRRC Report, No. 5, 1962; Tocher, Wagar, and Hunt, 1965; Wagar, 1966; Wennegren and Johnston, 1977). Human satisfactions are a basic product of recreation management and providing opportunities for them is the number one premise of recreation management (Wagar, 1966; Hendee and Potter, 1971).

The final component of demand for recreation opportunities is the demand for the opportunity to realize benefits from engaging in recreation activities. These benefits are assumed to enhance individual performance in everyday living (Driver and Brown, 1975, 1978; Driver, 1976). Benefits are the long-term effects of participating in satisfying recreation experiences.

These four categories of opportunities demanded by outdoor recreation participants are the essential elements of the product of recreation management--recreation opportunities. If these components of recreation opportunities can be identified, particularly desired attributes and outcomes, subsequent satisfactions and benefits can be measured. This will lead to precise and useful definitions of a variety of recreation products.

Descriptions of a variety of recreation products and the assessment of current recreation supply in terms of what is demanded by recreationists is supported by the mandates of recent legislation. The next section reviews these acts and how they apply to recreation planning and management.

Recreation Planning and Management

Legislative Basis and Direction

Since 1960, legislation concerning natural resources has emphasized conservation and planning to ensure that our resources are maintained into the future. Recreation resources have been highlighted in recent legislation with particular emphasis on the assessment and inventory of those resources. Below is a review of legislation that affects recreation resource management and the mandates for land managing agencies outlined in that legislation.

The Wilderness Act

The passage of the Wilderness Act (PL 88-577) in 1964 ensured the preservation of many large tracts of roadless areas. Two important objectives of this act are: (1) to maintain and perpetuate an enduring system of high-quality wilderness resource; and (2) to the extent that it is consistent with the first one, provide opportunities for public use, enjoyment and understanding of wilderness and the unique experiences dependent upon a wilderness setting.

The use of wilderness areas has increased 5 to 7 percent annually in the last two years. Because of this increasing use, managers of wilderness areas are faced with the problem of accommodating more users while protecting the environment as required by law.

Wilderness managers need some definitions of demand and criteria against which they can evaluate their areas. One solution to this problem is to inventory the desired recreation experiences of wilderness users and the environments associated with these experiences. Research

into these areas of inventory can help identify activities that are not compatible with the purpose of wilderness, solve user conflicts, and identify those activities that are most dependent on the wilderness resource (Hendee, 1974; Hendee and Burdge, 1974; Stankey, 1974).

Resource Planning Directives

The Resources Planning Act of 1974 (RPA) (PL 93-378) requires the U.S. Forest Service to conduct routine inventories of the nation's forest and rangeland resources. These inventories are consequently used to develop a strategy for allocating these resources to meet national needs and demands. The 1975 Renewable Resources Assessment Act Program acknowledges the deficiency in methods and technology:

> Because of the limited technology now available and the importance of demand-supply projections in buiding development and management practices, there is urgency in getting work underway on the development of methods and technology (p. 343).

Techniques for inventorying available resources and recreation opportunities are necessary to identify demand/supply relationships for recreation planners. Two assumptions must be made about inventorying recreation demand: (1) user perceptions are based on separable and identifiable elements of the recreation environment (desired outcomes and physical, social, and managerial attributes); and (2) satisfaction with (and motivation for) a recreation experience is sensitive to these elements.

National Forest Management Act

The National Forest Management Act of 1976 (PL 94-588) was intended as an amendment to the RPA. Land management planning direction is the

core of the Act. The Act emphasizes that the renewable resource program must be based on a comprehensive assessment of present and anticipated uses of renewable resources from the Nation's public and private forests and rangelands.

The Forest Management Act requires that lands be identified according to their suitability for resource management. The importance of inventorying and assessing the Nation's resources (including recreation resources) is emphasized in this legislation.

Bureau of Land Management Organic Act

The preparation and maintenance of an inventory of all land and resources is also required by the Federal Land Policy and Management Act of 1976 (PL 94-579, the Bureau of Land Management (BLM) Organic Act). The Act further requires review of all roadless areas of 5,000 acres or more for possible wilderness designation. Currently over 250,000 acres of BLM land are undergoing such review (Foster, 1976).

The Wilderness Act emphasizes the importance of identifying those elements of a wilderness recreation experience that are uniquely provided by wilderness areas. The legislation discussed emphasizes inventorying, assessing and planning for future resource needs. To carry out the mandates of these acts, the information needed for input into the planning process must be identified and techniques for collecting this information must be developed.

In the next section, the information needed for outdoor recreation management is identified. This is followed by a discussion of how this information can be integrated into the planning process.

Management Decisions to be Made

The information to inventory, assess and plan for recreation resources and the decisions to be made by recreation managers in light of this information have been identified in the carrying capacity approach to outdoor recreation management.

The concept of carrying capacity has been expanded from its original concept of dealing only with the physical resources to include public use of recreational lands and desired experiences. Carrying capacity based recreation management has been advanced by many authors (Lucas, 1964; Wagar, 1964, 1966, 1974; Lime, 1970; Lime and Stankey, 1971; Frissell and Stankey, 1972). Recreational carrying capacity can be defined as the amount and distribution of use which can occur on a tract of land given objectives for maintenance of the resource and a given recreational experience (Brown, 1975).

Figure 1 depicts the relationship between the three major decisions in a carrying capacity based management system: selecting management objectives, selecting management tools for meeting objectives, and selecting modifications to be made in tools and objectives after evaluation of the system.

There are three kinds of information that must be included in the management decision process: (1) user preferences and behavior; (2) physical resource capabilities; and (3) dynamics of the institutional directives (Lime and Stankey, 1971; Brown, Dyer, and Whaley, 1973; Brown, 1975, 1977; Brown, Driver, and Stankey, 1976). User preferences include types of activities, the desired physical, social and managerial attributes of the setting and desired outcomes. These preferences

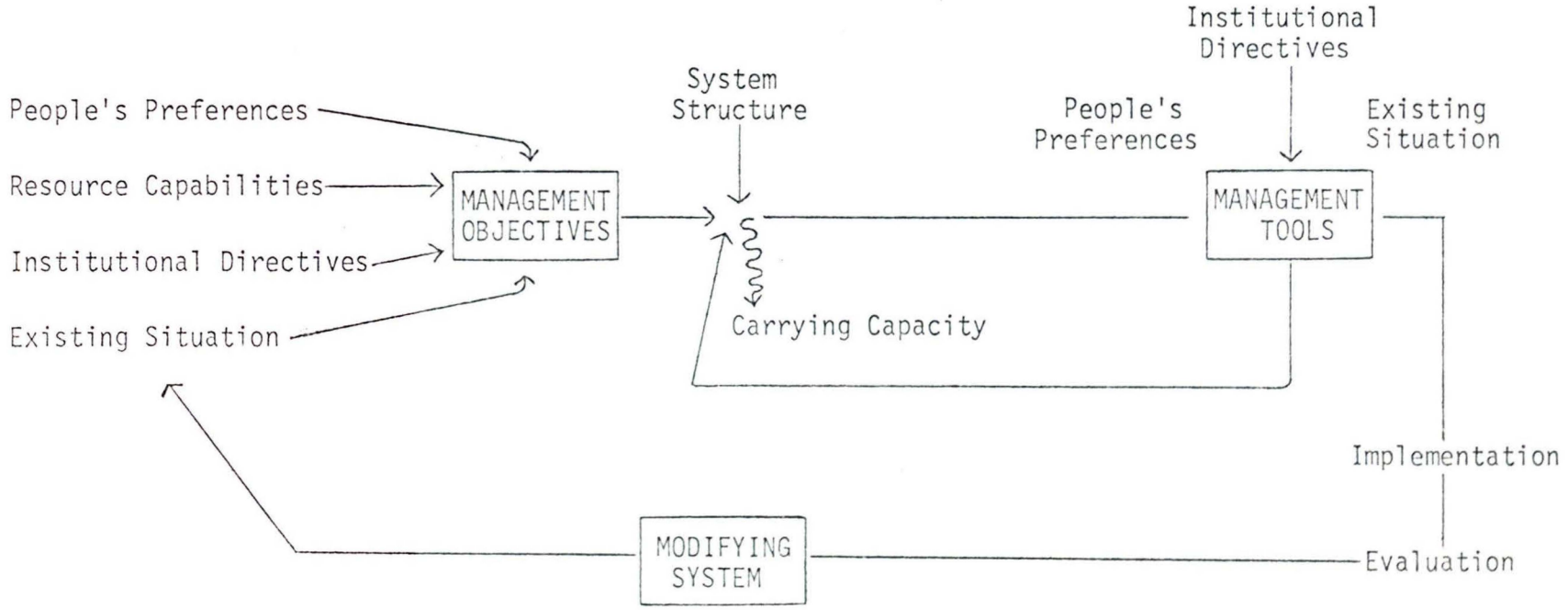

Figure 1. Decision points with their inputs and outputs for a carrying capacity based management system (from Brown, 1975).

provide managers information on the range of recreation experience opportunities desired by users and the support existing for the various recreation experience opportunities. A fourth input into management objectives is the existing situation (Brown, 1975, 1977; Brown, Driver, and Stankey, 1976). The existing situation includes present user characteristics, the condition of the resources and current management objectives. Resource capabilities pertain to potential experience opportunities that the area might support. Institution directives are agency and legislative requirements.

The output of the management objectives decision is an explicit set of objectives which define a recreation opportunity. The management objectives provide a definition of the recreational opportunities to be produced by the management system. The management objectives and structure of the resource system combine to produce a recreation carrying capacity estimate for an area. In addition to user preferences, institutional directives, and the existing situation, this carrying capacity estimate then becomes one of the inputs into deciding the selection of management tools. The carrying capacity estimate is also influenced by the management tools.

The selection of management tools that will carry out the management objectives and maintain a particular carrying capacity is followed by the implementation of those tools. The management procedures are then evaluated in terms of how well they are accomplishing the management objectives. A decision to modify the system might be made if the objectives are not being met, if other objectives become relevant, and so forth.

This carrying capacity based decision process identifies the decisions that must be made by managers and the information needed to make these decisions. How this decision process relates to a broader framework for recreation resources planning is examined in the following section. Additional information needed for this planning process is also identified.

The Recreation Resource Planning Process

Planning is the primary problem solving tool used in the management of recreation resources. Planning helps the manager make decisions about allocating resources and managing the resources for sustained production of desired recreation opportunities. This planning process requires the collection of and access to factual information on which to base planning decisions.

The planning process used to plan for recreational opportunities is similar to the process used in other resource areas, but much of the factual information needed as inputs into this process are still inadequately defined. A general framework for the recreation planning process is shown in Figure 2 (after Brown, Driver, and McConnell, 1978). There are six major steps in this process: problem identification, data gathering, alternative selection, public review, decision making, and the management decision process.

Step 1 in Figure 2 is the problem identification and objective formation stage in the planning process. The problem in recreational planning is accommodating all those who would like to use recreation lands while maintaining the integrity of the natural resources. The

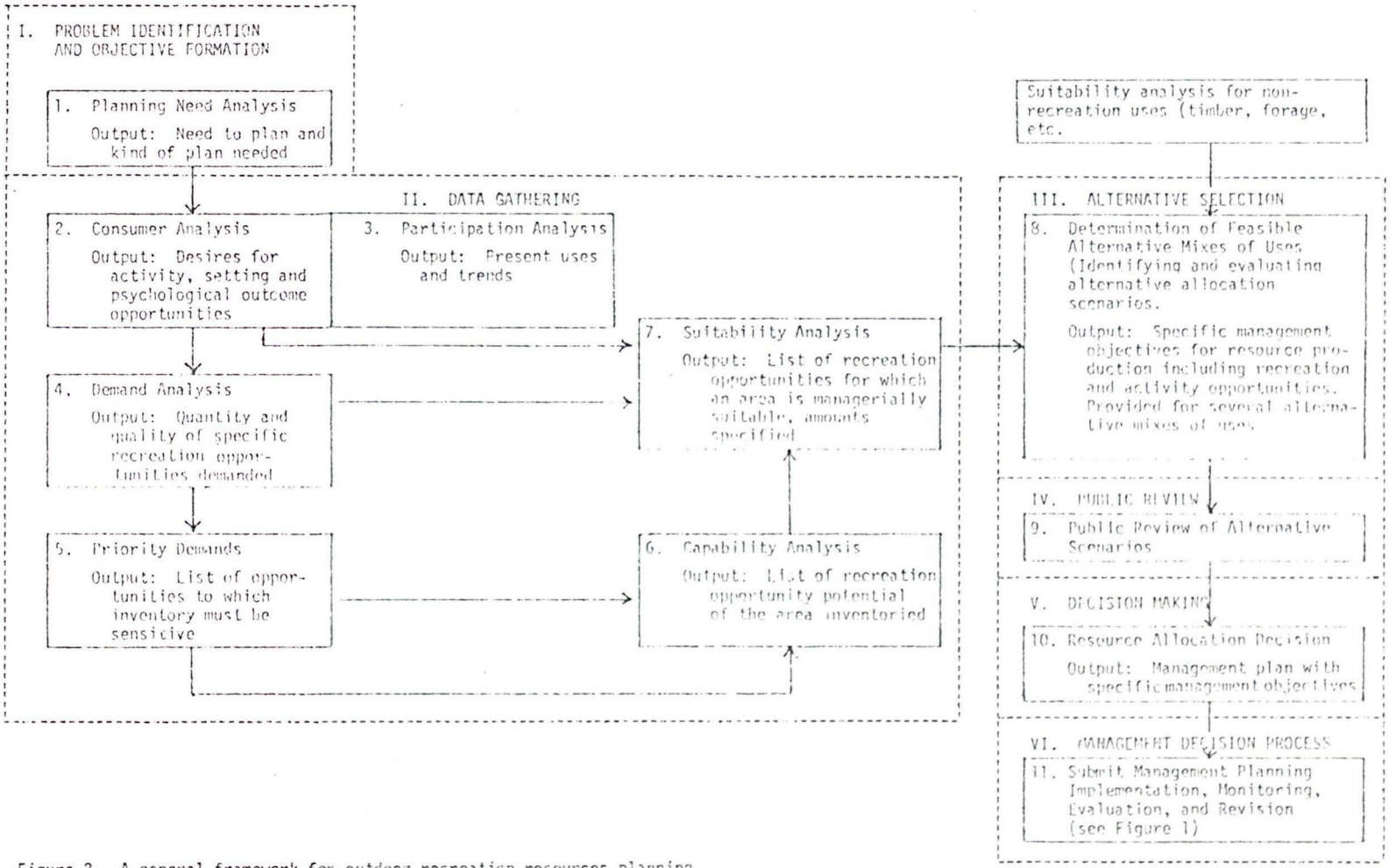
I. PROBLEM IDENTIFICATION AND OBJECTIVE FORMATION
1. Planning Need Analysis
Output: Need to plan and kind of plan needed
II. DATA GATHERING
2. Consumer Analysis
Output: Desires for activity, setting and psychological outcome opportunities
3. Participation Analysis
Output: Present uses and trends
4. Demand Analysis
Output: Quantity and quality of specific recreation opportunities demanded
5. Priority Demands
Output: List of opportunities to which inventory must be sensitive
7. Suitability Analysis
Output: List of recreation opportunities for which an area is managerially suitable, amounts specified
6. Capability Analysis
Output: List of recreation opportunity potential of the area inventoried
Suitability analysis for non-recreation uses (timber, forage, etc.
III. ALTERNATIVE SELECTION
8. Determination of Feasible Alternative Mixes of Uses (Identifying and evaluating alternative allocation scenarios.
Output: Specific management objectives for resource production including recreation and activity opportunities. Provided for several alternative mixes of uses
IV. PUBLIC REVIEW
9. Public Review of Alternative Scenarios
V. DECISION MAKING
10. Resource Allocation Decision
Output: Management plan with specific management objectives
VI. MANAGEMENT DECISION PROCESS
11. Submit Management Planning Implementation, Monitoring, Evaluation, and Revision (see Figure 1)

Figure 2. A general framework for outdoor recreation resources planning (adapted from Brown, Driver, and McConnell, 1978).

objectives of the planning process then become an outline for solving the problem. The central objective of this planning system is the provision of opportunities to obtain psychological outcomes and benefits to users. This is accomplished by supplying desired recreation experiences.

Steps 2 through 7 in Figure 2 are part of the data gathering stage of planning. Recreation research can have major input at this stage in the planning process. Steps 2 and 3 provide base information about the recreation opportunities in an area. At this step the traditional participation data and the components of the desired recreational experiences are collected. The demand analysis is the next step (4) in this recreation resource planning framework. The quantities and qualities of specific recreation opportunities are the information needed at this step. Questions such as, what activities are demanded, what kinds of attributes are demanded and which attributes contribute most to satisfying recreation experiences, what are the outcomes that are demanded, in which settings, and which contribute most to satisfying recreation experiences, are answered in Step 4.

The demanded recreation opportunities must be prioritized (Step 5) resulting in a list of opportunities to which the inventory process must be responsive. The information needed at this step is, what attributes are the most important to recreationists, what outcomes are preferred by individuals and what is the size and importance of groups that demand these outcomes. Additionally, which activities, attributes, and outcomes are dependent upon the uniqueness of the particular resource features of the recreation area are given priority. This prioritizing step ensures that highly demanded opportunities will not be overlooked in the inventory

process (Step 6). In Step 6 an inventory of setting attributes required for specific recreation experiences is conducted and a list of potential experience opportunities is made for the area. The manageability of providing these experience opportunities in the recreation area is assessed. A list of potential recreation opportunities that the area can provide is the result of Step 7.

This list of suitable recreation opportunities in Step 7 provides the basis for selecting alternatives (Step 8). The selection of alternatives incorporates information from other resource management areas (timber, range, water, etc.). However, some alternatives for which different groups express preferences might conflict with other resource alternatives. The list of alternatives is subject to public review and comment (Step 9) and finally some decisions must be made (Steps 10 and 11). This requires the weighting of preferences of different publics. Where legislative directives exist, those publics most in line with the directives are given preference. The final step of this recreation planning process (Step 11) is the management decision process, outlined previously, which utilizes similar information required in the entire planning process. It is here that the actual implementation of this planning process takes place.

The general framework for outdoor recreation resource planning and the process of management decision-making outline how managers can use specific kinds of information for effective recreation planning and management. What is lacking to make these processes effective is the specific behavioral information for specific recreation areas.

The Research Problem

Past research has shown that users within a particular recreation activity can be classified or typed based on their responses to desired outcomes (Brown, Hautaluoma, and McPhail, 1977; Driver and Cooksey, in press; Hautaluoma and Brown, 1978; Battle, 1978). These different types of users have different objectives for engaging in the same activities on the same tracts of land. These different outcomes can be measured and quantified and are important inputs for the recreational planning process. Desired outcomes and user types are important in the consumer analysis, demand analysis and priority ranking of demands in Figure 2 and for the management objective decision in Figure 1.

Recreation users select specific environments in which to engage in specific recreation activities. These selected environmental settings can influence which outcomes are realized by the recreationist (Knopp, 1972; Haas, Allen, and Manfredo, in press; Manfredo, Brown and Haas, in press). These desired attributes are an important part of user preference inputs for selecting management objectives and selecting management tools and techniques in Figure 1. Additionally, desired attributes are important in the consumer analysis, demand analysis and prioritizing demand outlined in Figure 2.

Besides being important in defining desired recreation experiences, identification of setting attributes is important in inventorying recreation areas in accordance with legislative directives (Wilderness Act, RPA, FMA, FLPMA) and for capability and suitability analyses (Figure 2). It is important for understanding the interaction among the three types

of attributes (physical, social, and managerial) as well as their interactions with the psychological outcomes. Identifying each of the individual attribute groups is important for inventorying a recreation area. The particular combinations of attributes that enhance the realization of desired outcomes is important for theoretical and practical reasons. Theoretically, combinations of attributes promote understanding of total environments. These environments in conjunction with psychological outcomes give a more accurate description of the product of wilderness recreation experience. This understanding can lead to the accurate prediction of recreation demand. Practically, better understanding of recreation products can facilitate more effective and equitable management decisions. Managers with limited economic and manpower resources could most efficiently employ their efforts in developing those attributes that most users require for realizing their desired outcomes.

A basic problem in recreation management is making decisions that are responsible to user desires while maintaining the resource base. To make such decisions in a planning framework, information on user preferences, specifically desired outcomes and attributes of the setting, is necessary.

Therefore, the objectives of this paper are:

1. To describe and quantify the desired psychological outcomes of wilderness users from the Maroon Bells-Snowmass Wilderness Area, grouping users into different types based upon their responses to different outcome items.

2. To describe the setting of the dispersed recreation experience in terms of the physical, social, and managerial attributes in which the desired outcomes can be realized.
3. To identify which type of attribute (physical, social, and managerial) is most important to the realization of desired outcomes for different types of users.

These objectives are consistent with the behavioral approach to recreation research which has conceptualized the components of demand for recreation opportunities (Driver and Brown, 1975, 1978). The research objectives for this project also identify elements of recreation opportunities that facilitate inventorying recreation areas as required by legislation and that are necessary for planning recreation areas.

The study area for this project was the Maroon Bells-Snowmass Wilderness Area in central Colorado. A sample of wilderness users was the study population for this research.

CHAPTER II

THEORETICAL BASIS FOR A RECREATION BEHAVIOR FRAMEWORK

The processes of decision-making are important to understanding any type of behavior where a choice between alternatives is involved. These processes are also important for the purposes of hypothesizing about future choices. Recreationists must make decisions on whether or not to recreate, in which recreation activity they prefer to engage, and in what setting they wish to engage in their preferred activity. Understanding the decision-making processes of recreation behavior can lead to identifying the elements that are important to recreationists in making their decisions. Knowledge of these elements is useful to management in providing satisfying recreation opportunities and in planning for future use.

Theories of decision-making study how people perceive, process, and evaluate the probabilities of unsure events. The primary focus of these theories is on choice behavior. Hammond et al. (1975) defines choice as dependent on a mode of thought that is quasi-rational, a synthesis of analytic and intuitive processes. Choice can be defined as the conscious or unconscious selection of particular actions out of all those that are physically possible (Galbraith and Cummings, 1967) or a set of selections over a range of commodities (King and Richards, 1974). Choice activities take place when: (1) there are two or more

alternatives; (2) the alternatives arouse a certain amount of conflict within the individual; and (3) cognitive processes aimed at reducing this conflict must occur (Hansen, 1976).

Choice and the decision-making processes are central to understanding recreation behavior. This section examines the importance of these concepts in the context of theoretical models. Expectancy-valence models advanced in the field of psychology are discussed in view of their application to recreation behavior research. Lawler's motivational force model and Fishbein's and Ajzen's attitude-behavioral intention model are discussed in detail. These models identify the important cognitive elements that lead to people making decisions. Consumer behavior models, as models of choice, are reviewed and a model of recreation behavior is presented.

Attitudes and Expectancy-Valence Theory

Attitudes are likes and dislikes (Bem, 1970), the intensity of positive or negative effect for or against a psychological object (Thurstone, 1946) or learned predispositions to respond in a consistently favorable or unfavorable manner with respect to a given object (Fishbein and Ajzen, 1975). Attitudes have been described as the most distinctive and important concept in understanding social psychology (Allport, 1968). It is generally assumed that attitudes toward objects exert powerful influences on behavior with respect to that object. Therefore, knowledge of people's attitudes contributes to explanations of their behavior (Baron, Byrne, Griffitt, 1974). There are two essential components of the attitude theory conceptualized by Fishbein

and Ajzen (1975). These components are: (1) beliefs, a person's information about an object; and (2) valences, evaluative response to some object, person, or idea. It is this combination of evaluations and beliefs that distinguishes attitudes from other concepts of psychology.

Expectancy-valence theory attempts to identify relationships and variables in a dynamic state as they affect individual behavior (Fishbein and Ajzen, 1975; Steers and Porter, 1976).[4] The foundations for this theory are based on the earlier works of Lewin, Tolman, and Murray, and similar work by McClelland and Atkinson. Expectancy-valence theory postulates that human behavior is a function of the interaction between the characteristics of the individual (such as attitudes, needs, values, and personality characteristics) and the individual's perceived environment. The major variables of expectancy-valence theory are: (1) an expectancy or subjective probability that a particular action will result in a particular outcome; and (2) a valence or evaluation (either positive or negative) of that outcome.

Expectancy-Valence and Motivation

Expectancy-valence models have been used extensively in industrial-organizational psychology to explain motivation in work

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[4]There are many theories on attitudes in psychology, not all of them useful in explaining decision-making behavior. Doob (1947) supports learning theories of attitudes. Learning theories concentrate on explaining how attitudes are formed and not the relationship between attitudes and behavior. Attribution theory (Heider, 1958) and cognitive dissonance theory (Festinger, 1957) both explain changes in beliefs, just one component of attitude. The balance theory (Cartwright and Harary, 1956) is not comprehensive. It restricts its explanations to the relationships between a maximum of three entities (Fishbein and Ajzen, 1975).

environments.[5] Lewin's (1938) definition of motivation as a tendency to act in a certain way, depending on the strength of the expectancy that the act will lead to a particular goal and on the value of that goal, in essence defines the components of expectancy valence theory. Vroom (1964, 1966) defines motivation as a "process governing choices made by persons or lower organisms among alternative forms of voluntary activity" (page 3, 1964). The "process" in Vroom's definition refers to the "expectancy" and "value" in Lewin's definition.

Vroom has developed an expectancy value-model of motivation, similar to those developed by Lewin (1938), Edwards (1954), and Atkinson (1958, 1964). Vroom's model has two levels of outcomes, the second level stemming from the attainment of the first. He postulates that motivation will vary with the valence of the first and second level outcomes. Vroom suggests that at any given point during the decision process, the attractiveness of an object or action is predictable from measuring the outcomes or goals and estimating the instrumentality (expectancy) of the individual for the attainment of those outcomes. In Vroom's model, outcomes have value if they lead to other valued outcomes. Valence, in Vroom's model, refers to anticipated reward and not actual value when obtained. Ultimately, the difference in valences reflects the differences in preferences for the second level outcomes. The expectancy and valences for outcomes combine multiplicatively to produce an estimate of motivational force.

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[5] S. Morton McPhail (1978) discussed extensively the history and development of expectancy-valence theory. This also includes discussion of the controversy surrounding the mathematical relationships between the elements of the model.

A major flaw in Vroom's model is that it is centered around an "economic man" approach which assumes that man "maximizes" alternatives or chooses alternatives that supply the most of some desired object or state. This has been modified by a "satisficing" approach (Simon, 1958) that hypothesizes that man chooses alternatives that contain some of a desired object or state, but not the maximum of that desired object or state. Another problem with Vroom's model is its attempt to predict actual behavior. Newer models of expectancy valence theory recognize that environmental (setting) and intervening variables can produce discrepancies between the intent to behave in a particular manner and actual behavior. These intervening variables make actual predictions of behavior risky. More recent models attempt to predict a behavioral intention to act and not actual behavior.

Lawler's Motivational Force Model

Lawler developed his model of motivational force to explain job performance in a work environment. Effort, performance, outcome and valence are used to obtain an estimate of motivational force. Lawler's model is shown below:

$$F_m = \Sigma \left[(E \rightarrow P) \times \Sigma ((P \rightarrow O)(V)) \right]$$

where: F_m = Motivational Force

$E \rightarrow P$ = The expectancy that some effort will lead to some performance

$P \rightarrow O$ = The instrumentality or momentary belief that some performance will lead to some outcome

V = Valence, a subjective value placed on a particular outcome

This expectancy component, in a job-related setting, could be spending extra hours at work in the hope of completing an important task early. In a recreation setting, this could be spending the extra time to tie one's own flies to facilitate a satisfying fishing trip (realizing desired psychological outcomes).

The single most important determinant of a person's E → P expectancy is the objective situation, assuming that a person's perception of the situation is accurate. Another determinant of the E → P expectancy is self-esteem and beliefs that subject has concerning his/her response capabilities. Past experiences in similar situations, where learning plays a role in developing more accurate E → P expectancies, and communications from others (or depending on others' past experiences) are also determinants of E → P expectancies (Lawler, 1973). Lawler hypothesized that because expectancies are reality based, by changing the situation, E → P expectancies can change and influence a person's motivation toward an action or object.

The instrumentality P → O is also a probability, but it is the probability of attaining an outcome from a particular performance. For example, the P → O component could involve finishing an important task early to receive a merit raise or be recognized as employee-of-the-month. In recreation, a satisfying fishing trip may lead to development of skills, self-esteem, and/or escape from daily pressure.

Lawler specifies six determinants of the P → O instrumentality. Past experience in similar situations, the attributes of the actual situation (setting), and communications from others are the same determinants that influence E → P expectancies. Additional determinants are the

attractiveness of outcomes, the E → P expectancies associated with the outcomes, and a person's belief in internal versus external control.

In the model, each P → O instrumentality is multiplied by a valence. The valence (V) associated with the P → O instrumentality is the value that an individual places on an outcome. Lawler's model assumes that outcomes will be positively valued if they are believed to provide satisfaction. Attractiveness of outcomes or valence is one of the determinants of the P → O instrumentality. This is included as a determinant because positively valued outcomes seem more likely to occur to people than negatively valued outcomes. Therefore the valence has an effect on the P → O probability.

Of the three factors that influence motivational force, E → P expectancies, P → O expectancies, and attractiveness of outcomes, Lawler focuses on understanding the P → O instrumentality because it can be most easily and directly influenced by organizations. This is also true for recreation management because it must provide the opportunities for realizing outcomes. Lawler asks three questions about outcomes that are particularly pertinent to recreation management: (1) What is the nature of individuals that causes outcomes to be desirable to them? (2) What general classes or groups of outcomes do people find desirable? and (3) What factors (attributes) influence the desirability of outcomes? Questions two and three are objectives of this study.

Fishbein and Ajzen's Behavioral Intention Model

Fishbein and Ajzen (1973, 1975) have developed a model for expectancy-valence theory that is applicable to all kinds of behavior in

all kinds of settings and is not specific to the work environment. This model predicts behavioral intentions, the intention of performing a given action in a given situation, which is similar to Lawler's motivational force. This model is based historically on Tolman's 1932 model of path-goal or "means-end" approach to motivation that was essentially cognitive in nature and attributed behavior of humans in terms of goal readiness (Dawes, 1972). Fishbein and Ajzen (1975) acknowledge this beginning as well as pointing to Dulaney's (1968) theory of propositional control as having influenced their model.

Fishbein and Ajzen's model is:

$$B \sim BI = [A_{act}]\, w_0 + [\Sigma\, NB\, (Mc)]\, w_1$$

where: B = Overt behavior

BI = Behavioral intention

A_{act} = Attitude toward the act

NB = Normative belief of a referent group

Mc = Motivation to comply with a referent group

w_0 and w_1 = Empirically determined regression weights

The focus of this model is the prediction of specific behavioral intentions. These intentions relate to particular actions in particular situations. Behavioral intentions may not correspond exactly to overt behavior because of intervening variables, however, they do correlate (Locke, Bryan, and Kendall, 1966; Fishbein and Ajzen, 1974; Belk, 1975).

The A_{act} component of Fishbein and Ajzen's model is the individual's attitude toward performing a particular act in a given situation with

respect to a given object. This component is further defined in the following equation:

$$A_{act} = \Sigma Be$$

where: B = Individual's belief about the probability that the behavior in question will result in some outcome.

e = Individual's evaluation (favorable or unfavorable) of the outcome.

A major focus of Fishbein's work is defining attitudes. Attitudes are defined as a predisposition to act in a favorable or unfavorable manner toward an object or concept (Fishbein and Ajzen, 1975). The A_{act} part of the model has both a cognitive (belief about probability) and an affect (valence) measure. The "B" and "e" components are the $P \rightarrow O$ instrumentality and the V (valence) components of Lawler's model, respectively.

Beliefs are very important elements in the model. A person learns or forms a number of beliefs about an object. A person's attitude toward some object is determined by the person's beliefs that the object has certain attributes and the person's evaluations of those attributes. Woodside and Clokey (1974) have pointed to research that indicates beliefs alone are important for predicting attitudes, however these may be specific cases, such as when the importance variable is the same among the dimensions.

Normative beliefs are an explicit and separable part of the Fishbein-Ajzen model. The normative component refers to the value of the expectations of referent individuals or groups to the person making the decision.

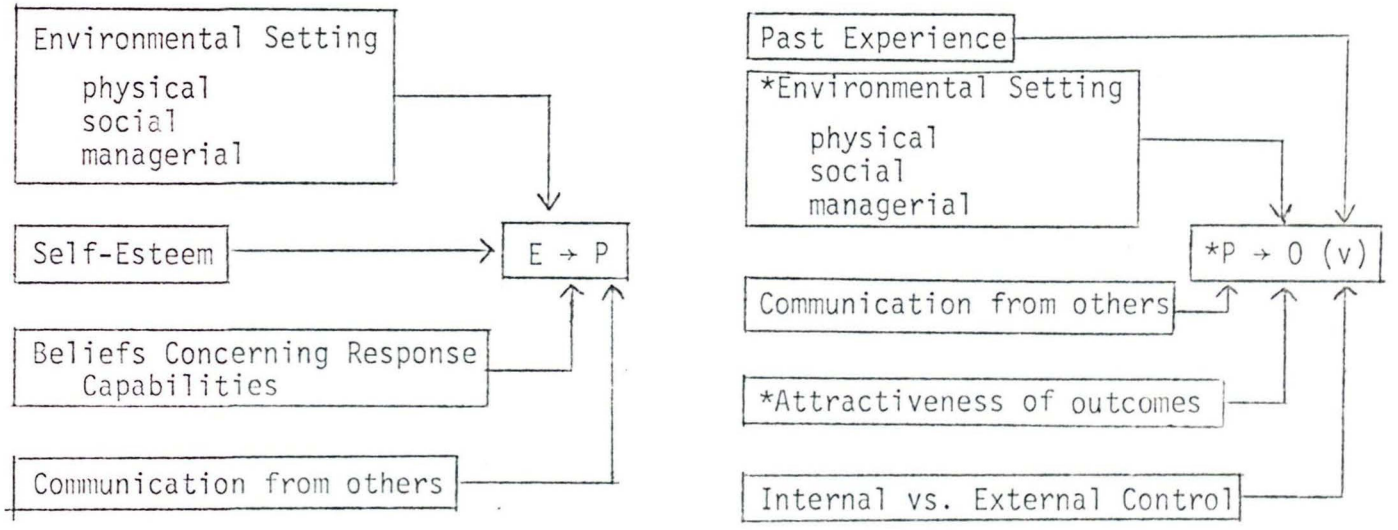
This assumes that a person's beliefs and evaluations about objects or actions may be separable from the beliefs one's referent groups hold about the same object or action.

For the purposes of explaining recreation behavior, Lawler's and Fishbein and Ajzen's models can be considered the same. Both models predict the decision to behave and not the actual behavior. Both models have expectancy probabilities and valences associated with them. Both refer to outcomes and attributes.

An advantage of Lawler's model is the separation of the expectancy into two components. This allows for a more precise definition of the variables, which aids in narrowing the scope of research when investigating these variables. The interest of this research is on the $P \rightarrow O$ component, or the outcomes and valued attributes people seek in wilderness experiences. The rationale behind this interest in the instrumentality component is that activities are substitutable for each other if they result in the same outcomes (Havighurst, 1967; Hendee and Burdge, 1974). This is particularly important to the development of urban recreation areas where some recreation opportunities, such as wilderness experiences, are not available and substitutes for these experiences can be found. Figure 3 shows the major determinants of Lawler's model and the components that are of interest to this research.

Consumer Behavior

Theories of consumer behavior model how people make their choices when selecting a particular product or brand over another. Many of the



*areas of interest to this research.

Figure 3. Determinants of E → P and P → O expectancies and valence in Lawler's motivational force model.

components of consumer behavior models are useful in studying recreation behavior.

Consumer behavior models are based on economic theory, which defines most of the components of the decision making processes. The two major components of consumer behavior models are variables concerning the consumer and variables concerning the consumer's environment. Choice takes place as a result of the interaction between these two components. Consumer behavior models modify the economic theory requirement that people choose to maximize benefits or satisfactions and conform more closely to Lawler's "satisficing approach."

A consumer decision model has six major steps: (1) a consumer is stimulated to search; (2) selects a limited choice of products; (3) evaluates the attributes of each product either positively or negatively; (4) makes a selection; (5) consumes the product (specific behavior); (6) the behavior becomes past experience and influences future searches. All of these steps take place in an environment which may influence any of the six steps (Sheth, 1974; Belk, 1975).

Consumer behavior models are very similar to expectancy theory models for decision-making. Consumer behavior models examine attitudes in terms of how attitudes are affected by attributes of products or objects and the situational variables. The multi-attribute theory of consumer behavior hypothesizes that a person's attitude toward an object or action involves cognitive processes that compare attributes across objects. Each object or action is described in terms of attributes of value and outcomes (Woodside and Clokey, 1974; Hammond et al., 1975). The more important the attribute, the more important it is as a

determinant of choice (Woodside and Clokey, 1974; Belk, 1975). For example, if the attribute of a car, such as color, is more important to you than another attribute, such as gas mileage, then color would be a major determinant in your choice of cars.

This comparison of attributes and outcomes parallels the process for selection of a recreation activity and site. A model of recreation behavior must have an individual with a personality and past experience, allow for search behavior and weighing of alternatives, allow for consumption (participation), and produce satisfaction and benefits.

User Preferences and a Model of Recreation Behavior

Early investigators of recreation phenomena urged more emphasis on quality recreation experiences, rather than the quantity of people visiting a site or area (Havighurst, 1957; Sieker, 1951; Wagar, 1951). The Outdoor Recreation Resources Review Commission (ORRRC) (1962) utilized visitor days and road counts as demand estimates in the nationwide assessment of recreation. However, at least two of the ORRRC reports (No. 2 and No. 5) suggested initiating research into user preference studies as a means of more accurately describing recreation demand. That quality is important to recreationists (e.g., number of camping sites, number of trails, game bagged, etc.) has been borne out in recent hunter studies (Brown et al., 1977; More, 1973; Potter et al., 1973). These studies found that the aesthetic aspects (e.g., enjoying nature) of the hunting experience were frequently valued higher than harvesting game.

User preferences were recognized early as a means of helping managers of recreation areas solve some management problems, such as user conflicts, resource damage, needs of informational and interpretive systems, and other planning and management problems (Lucas, 1964; Tocher, Wagar, and Hunt, 1965; Wagar, 1964, 1966).

Increasing numbers of researchers have called for more information on user preferences and other psychological dimensions (Mercer, 1971; Driver, 1972; Brown et al., 1973; Hendee and Burdge, 1974; Lime, 1974; Stankey, 1974). Peterson (1974) noted that psychological inventories could be used to measure aspirations for and perception of a spectrum of details about the recreation experience. These elements can be measured in terms of the desired and perceived level of presence in the recreation area. In addition to psychological preference elements in the environment, physical and social elements of the environment that the recreationist seeks might be just as important to recreation behavior (Wagar, 1966; Knopp, 1972).

Researchers have recognized that recreation behavior involves a great deal of psychological activity and that some of the final products of recreation experiences (satisfactions and benefits) are psychological in nature. In response, a model of recreation behavior based on expectancy-valence theory and consumer behavior models of decision making has been developed.

A model of recreation behavior first presented by Driver and Brown (1975) is shown in Figure 4. An underlying assumption of this model is that specific satisfying experiences determine the attractiveness of a particular activity or environment.

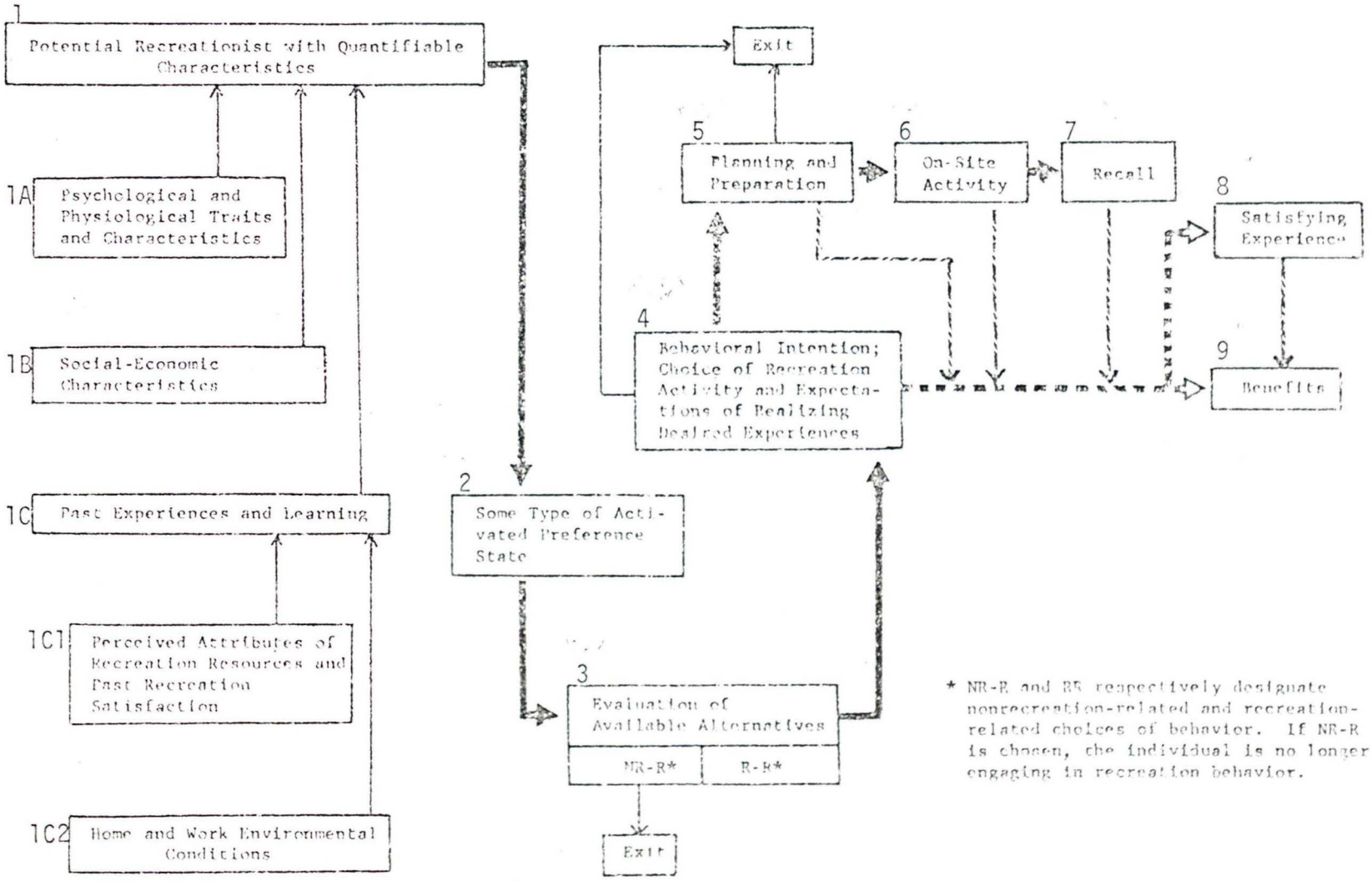


Figure 4. Quantifiable sets of variables within a sequential model of recreational behavior (after Driver and Brown, 1975).

The model represents the decision process that a potential recreationist goes through when choosing a recreation site or activity. These steps are the same elements that were outlined in the consumer behavior models of choice. At step (1), there is a potential recreationist with some basic characteristics based on personality and past experiences. The individual becomes inclined toward some behavior (2) and searches for and evaluates alternative behaviors (3). The individual can exit the model at this point by choosing some non-recreation behavior. At (4), the individual is constrained in his/her choices of activities and places to recreate by time, money, desired experiences and settings, and supply. Steps (5) through (7) are the actual recreation engagement processes, beginning with planning and anticipation of the experience, actual recreation activity, and recall of the experience after the person is back home. The environmental influences are present at all stages of this model, but are particularly relevant at (6), the actual activity. It is here that the manager can manipulate some of the environmental influences (attributes) to increase the opportunities for satisfying experiences. The two outputs of this model are satisfaction and benefits, steps (7) and (8). These outputs then feed back into the basic user characteristics, step (1), and influence future decisions.

Models of decision-making identify the elements that are important to individuals when choosing between alternatives. Understanding how these elements interact is useful in understanding recreation behavior (as conceptualized by Driver and Brown) and when hypothesizing about future choices (estimating future demand).

The models presented have influenced the direction of this project. In Lawler's formulation, people will select performances (P) (recreation activity) that lead to desired and valued outcomes (O). One of the determinants of the P → O probability in Lawler's model is environmental attributes. Also, consumer behavior models specify that there are attributes of the product (recreation opportunities) that influence choices. Some of these attributes can be major determinants of choice. In recreation, it is the attributes of the setting that can influence the choice of site in which to engage in a recreation activity. These attributes can then enhance the attainment of desired outcomes.

The elements of recreation decision making investigated by this research are outlined in Lawler's and the consumer behavior models. These include (1) identifying those psychological outcomes desired by wilderness users and (2) identifying which attributes of the wilderness setting contribute to satisfying recreation experiences and (3) identifying which attributes are most important to wilderness recreationists.

The following chapter outlines the methodology used to collect and analyze the data from the Maroon Bells-Snowmass Wilderness users.

CHAPTER III

PROCEDURES

This section presents the techniques used in the collection and classification of data. The techniques are described and justified; three survey instruments are discussed:

1. A front-end interview schedule for collecting the names and addresses of wilderness users.
2. A preliminary questionnaire used to gather an initial importance to satisfaction measure for each attribute item.
3. A mailback questionnaire for collecting wilderness users' scores on psychological outcomes, relative importance measures between attributes, and socio-demographic data.

Data analyses involved the use of the Statistical Package for the Social Sciences (SPSS) (Nie, et al., 1975). Frequencies and cross-tabulation analyses were used to describe and characterize the sample population. Cluster analysis techniques, ICLUST (Revelle, 1977) and NORMIX (Wolfe, 1974), were used to identify types of wilderness users based on their responses to psycholgoical outcome and setting attribute items. Analysis of variance was used to determine relationships between a wilderness user's scores on outcome items and attribute items. Other data analysis techniques are discussed in terms of study objectives.

Study Area

The participants in this study were selected from wilderness users of the Maroon Bells-Snowmass Wilderness Area (Figure 5). The area is a 66,380-acre wilderness area located in the Rocky Mountains of Pitkin and Gunnison counties, Colorado.

The Elk Mountain Range traverses the area. The mountains are rugged, very picturesque, and range in elevation from 12,000 to 14,259 feet. The plant life and wildlife are varied. Timbered areas consist mainly of aspen, Engelmann spruce and sub-alpine fir, interspersed with colorful fields of wildflowers and grasses. Wildlife includes small rodents, porcupine, deer, elk, bear, and 90 different species of birds. An abundance of lakes and streams maintain populations of brook, rainbow, brown and cutthroat trout.

Front-End Interview Schedule

The front-end interview schedule has been used in research at Colorado State University for three years (Appendix A). Party size, composition of group, length of stay, engaged-in activities, and names and addresses of recreationists are collected using the front-end interview schedule.

The MBSW front-end interview schedule was administered during the summer of 1978. Parties exiting the wilderness area along trails and roadways were sampled. Those parties that were passing through the area on their way to recreation areas elsewhere or were in the area for non-recreation reasons were not interviewed further and their names and addresses not solicited. A total of 3,177 recreation interviews were made.

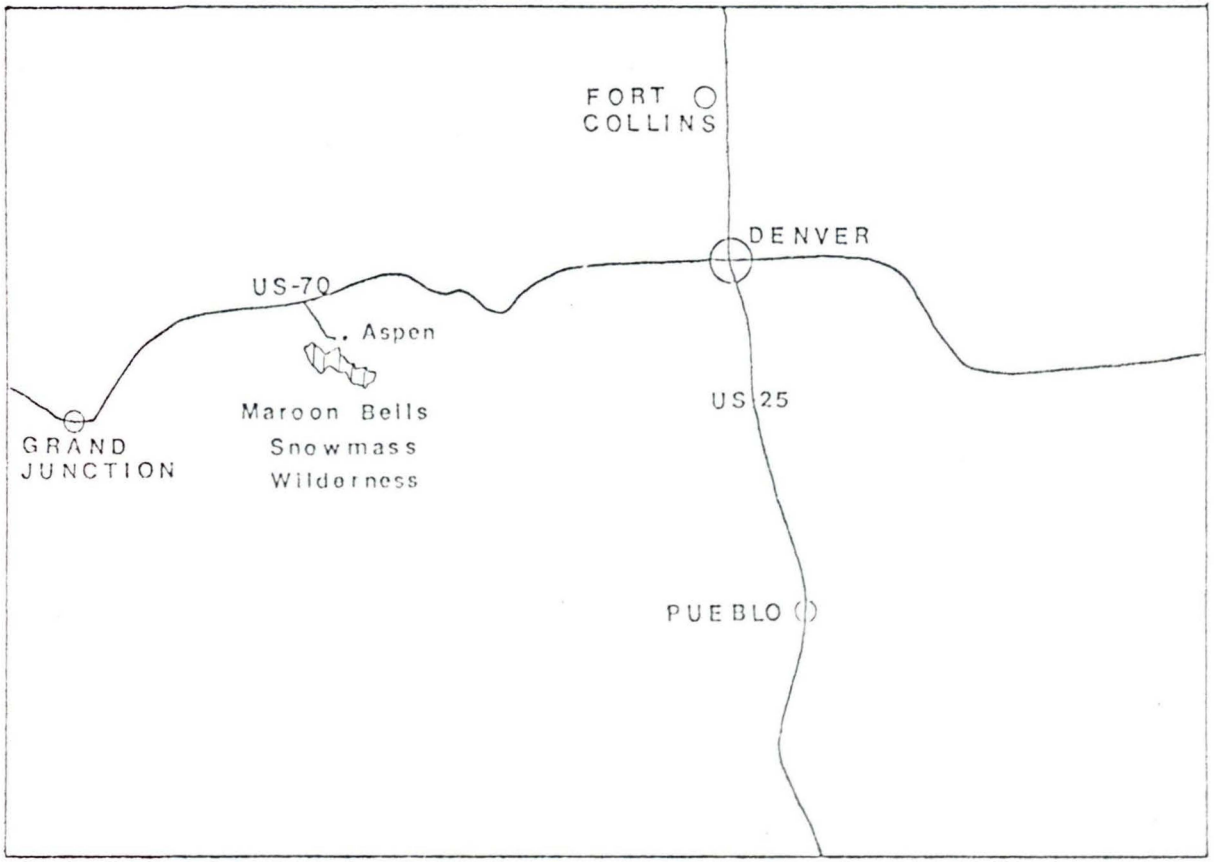


Figure 5. Study area--The Maroon Bells-Snowmass Wilderness, Colorado.

Preliminary Questionnaire

The preliminary questionnaire was used to develop mean score values of physical, social, and managerial attributes for experienced wilderness users (Appendix B). This information was vital to the development of the mailback questionnaire.

The collection of socio-demographic information on respondents to the preliminary questionnaire enabled comparisons of the characteristics of respondents to the preliminary and mailback questionnaires. Information on age, sex, size of party on last trip into a wilderness area, number of trips into wilderness areas, city size, and education was collected.

The attribute items used on the preliminary questionnaire are shown in Tables 1, 2, and 3.[6] The items in the tables are grouped by the apparent dimensions of the attribute they tap. The physical attributes have been statistically analyzed using the BC-TRY cluster analysis program. These groupings of physical attributes do appear to tap similar dimensions based on the BC-TRY analysis. The social and managerial attributes, at this point, are grouped on an intuitive basis. Wherever possible, nouns only are used to represent an attribute to avoid including more than one dimension per attribute. In some cases, particularly in the social attributes, verbs are used in conjunction with the nouns to clarify the attribute.

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[6]The selection of these attribute items was based on discussions with Glenn Haas, Charles Harris and Michael Manfredo, all graduate students at Colorado State University, Fort Collins, Colorado. Haas, Harris and Manfredo are all conducting research using attributes of wilderness areas. Additionally, attribute items were selected on how well they describe the actual physical, social, and managerial attributes of the MBSW area.

Table 1. Physical attribute items.

Fish Related	Water Related
Cutthroat trout	Natural lakes and ponds
Slow moving streams with deep holes	Cascading streams
Good fishing streams	Clean, drinkable water
Rainbow trout	Beaver ponds
Naturally reproducing native fish	Waterfalls
Rugged Topography	**Meadow/Forest**
Boulder fields	Dense/thick undergrowth
Barren, rocky peaks	Gently rolling topography
Evidence of glacial activity	Wildflowers in bloom
Areas above timberline	Virgin forests
Snowfields	Evergreen forests
Rugged terrain	Aspen groves
Panoramic (wide angle) vistas	Seeing stripped or damaged trees
	Variety of buds
Wildlife	**Rare, Unique Natural Features**
Ptarmigan (birds)	Evidence of forest fires
Bighorn sheep	Unusually shaped rocks
Small animals (pica, ground squirrels, etc.)	Rock slides
Presence of beaver	Fresh, clean air
Presence of mule deer	Unpredictable weather
Variety of birds	
Coyotes	
Presence of elk	
Other	
Hearing machinery-engines	
Soil erosion around campsites	
Deeply eroded trails	
Dead vegetation around campsites	

Table 2. Social attribute items.

Indirect Evidence Others
Fire-rings at campsites
Shortcut trails between switchbacks
Litter along the trail
Brightly colored equipment
Litter at campsites
Conflicts
Camping within sight and hearing range of another party
Camping within sight of 1-2 parties which are out of hearing range
Loud, boisterous people
Campsites that are close together
Someone walking through your campsite
Camping within sight and hearing range of three or more parties
Meeting a party of six or more on horseback during the day
Camping where three other parties are within hearing range
Meeting Others
Considerate, respectful people
Meeting three or more hiking parties during the day
Briefly chatting with others on the trail
Briefly chatting with others at your campsite
Long conversations with others on the trail
Long conversations with others at your campsite
Not Meeting Others
Camping with no one in sight or hearing range
Not meeting any other groups during the day
Seeing no one else, except the members of your party, for 2-3 days

Table 3. Managerial attribute items.

Signs
Few signs in the wilderness
Directional signs along trails
Trail signs with destination mileages
Structures
Man-made structures (bridges, cabins, etc.)
Bridges placed at dangerous stream crossings
Footbridges over boggy areas
Access Related
Well-maintained trails, free of obstacles
Lakes with no trails to them
Camping near good technical climbing areas
Steep trails
Conflicts
Presence of domestic livestock
Evidences of domestic livestock (grazed over, droppings, etc.)
Long strings of pack animals
Seeing domestic livestock
Pets on leashes
Pack animals that have wandered
Pets running loose
Poor sanitation disposal near campsites
Information
Uniformed wilderness rangers
An accurate map of campsites
Knowing where the crowded areas of the wilderness are
Knowing the regulations governing an area

Subjects for the preliminary questionnaire were selected from three undergraduate classes in the College of Forestry and Natural Resources. Class members were asked to participate in the survey if they had been in a Colorado wilderness area within the last two years.

Seventy-five subjects responded to the preliminary questionnaire. The first question on the questionnaire was to name the wilderness area the subject had visited most recently. If this was left blank or included areas that were not wilderness areas and/or not in Colorado, the questionnaire was discarded. This resulted in a total of 44 completed questionnaires.

Respondents were asked to score each attribute item on a 9-point scale in terms of how much each one added to or detracted from satisfaction with a wilderness experience. A list of eighty-four attributes was included on the preliminary questionnaire.

Mailback Questionnaire

The purpose of the mailback questionnaire (Appendix C) was to obtain a rating of the three attribute groups for each respondent, collect information on desired outcomes, and identify socio-demographic characteristics of respondents.

The socio-demographic questions were similar to those asked on the preliminary questionnaire. These included age, sex, marital status, education, previous experience in wilderness areas, city size, length of stay on last wilderness trip, party size on last wilderness trip, and if their last trip into the MBSW was what they expected.

The selection of psychological outcome items was taken from a list of outcome scales developed by Driver and Brown (Appendix D). The outcome items were rated on a 9-point adds to - detracts from scale[7] in terms of what effect that item would have on a future wilderness experience in the MBSW. The outcome items appeared in a random fashion. The first two items were not coded to give the respondents a chance to get used to the scoring of the scale items (Driver and Knopf, 1975).

The purpose of the attribute items on the questionnaire was to get respondents to indicate which of the three attribute types (social, physical, or managerial) was most important to them in a wilderness environment. Attribute items were grouped together based on the mean scores obtained from the preliminary questionnaire. The mean scores from the preliminary questionnaire were based on a 9-point scale. Items with the same (or similar) means were judged to be equal in terms of how much the item added to or detracted from satisfaction.

Six attribute items were grouped together, two items from each social, managerial, and physical attribute group. This enabled the respondent to rate two items from the same attribute type higher than the other attribute types.[8]

Six groups of attributes, within six items in each group, were used. Two of these groups were labeled highly rated attribute items, two

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[7]Fishbein and Ajzen (1975) strongly recommend the use of a bi-polar scale when dealing with concepts of attitude.

[8]Since attributes are grouped based on the same (or similar) means and are judged to be equal in terms of their effect on satisfaction, the problem of the effect of item position (using all possible combinations of items) is negligible. The largest difference between means in a group of six items was 1.6.

groups were labeled moderately rated items, and two groups were labeled negatively rated items.[9]

Users were asked to assign 100 points to the one attribute item in a group of six attributes that was most important to them in the wilderness environment. Then, respondents were asked to assign points to the other items in that group based on how important an item was in comparison to the 100-point item. For example, if the item was only half as important (e.g., not seeing any litter) as the 100-point item (e.g., natural lakes and ponds), the respondent would assign that item 50 points. Four groups of six items (two groups of high mean items and two groups of moderate mean items) were assigned points using the method described above.

Two groups of six attributes that had low mean (negatively-valued) items from the preliminary questionnaire were given separate instructions. For these two groups, the item in a group of six that was the least desirable (or worst) in a wilderness experience was given 100 points. Then the other items in the group would receive points in comparison to the least desirable item. For example, an item that was only half as bad (e.g., deeply eroded trails) as the 100 point item (someone walking through your campsite) would receive 50 points.

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[9]Bass et al. (1974) have suggested that judges might change ratio ratings of items based upon how important the item is to them. Like items (similar means) must be grouped together and groups with different ratings of importance must be analyzed separately. Therefore, groups were labeled high, moderate, or negative.

Cluster analysis of the attribute items on the mailback questionnaire grouped attributes that were very similar to the ratings of these items on the preliminary questionnaire. High, moderate and negative items tended to cluster together. This adds support for pre-clustering items based on previous scores. The results of this cluster analysis are shown in Appendix E.

This method of point allocation allowed respondents to use their own judgment and rate attribute items in a group identically or differently depending on their perception of item importance. Respondents could have used decimals or fractions when assigning points to them, but not negative numbers.

Ratio Scaling

The assignment of points among a group of items is a form of ratio scaling. Ratio scaling is a theoretical measurement concept that assumes equal intervals among a set of stimuli and it implies an absolute zero point. Equal ratios are represented as successive equal intervals beginning at a zero point or some other value point of the scale (e.g., weight or height measurements). Using these equal ratios, numbers can be assigned so that equal ratios among them correspond to equal ratios of some attribute (Stevens, 1951; Guilford, 1954).

One method of ratio scaling is called fractionation. It requires a subject to judge stimuli in reference to a standard or between stimuli (Jones, 1954). An example of the fractionation method would be to have a subject experience 0°C air temperature and then rate two other rooms with different air temperature as ratios of the first (e.g., two times warmer, four times warmer, etc.).

Another method of ratio scaling is the constant sum method. The basic design for this methods is to give a subject 100 points to divide between pairs of stimuli, based on the amount of some attribute (Guilford, 1954). An example would be to ask a subject to assign 100 points between two lights of different brightness. A score of 60 and

40 would mean the subject judged one light one and one-half times as bright as the other.

Criticism of the fractionation and constant-sum methods are summarized in Garner (1954), Guilford (1954) and Jones (1974).[10]

The procedure used in this study is a variation of the fractionation method. The difference between the fractionation method used here and the classifical fractionation methods is that there is not a preassigned standard, there is not one item in a group that always receives the 100 points. For example, this procedure would be classical fractionation if the first item in a group of six was always assigned 100 points and then the other items rated in comparison to this item. However, in this project the 100-point anchor is determined by individual respondents and not pre-assigned by the researcher.

This ratio-scaling fractionation method is more efficient than rank-ordering because it allows for magnitude differences between items and it is better than a paired-comparisons method because it allows for the use of more variables.

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[10]The most notable work in the development of ratio scaling (magnitude estimation) has been conducted by S. S. Stevens (1962, 1966, 1974). Stevens' initial work in the development of ratio scales began with his loudness estimation experiments in the 1930s. Subjects were asked to indicate how much louder one noise was than another. Other experiments during the 1930s were also attempting to ratio scale such stimuli as pitch, visual numberousness, visual flash-rate, pain, sweetness-sourness-saltiness, subjective weight and visual brightness. These other experiments asked subjects to adjust the stimuli to some ratio that they perceived to exist. Two recent studies (Bass et al., 1974 and Carroll, 1971) have supported Stevens' work, while Anderson (1974, 1976) contends it is more of a rating method than true ratio scaling.

Data Analysis

Preliminary Questionnaire

Analysis of the preliminary questionnaire was a prerequisite for the development of the mailback questionnaire. Analyses were performed using the Statistical Package for the Social Sciences (SPSS) (Nie et al., 1975) on the Colorado State University CYBER 172 computer.

Frequency analysis produced the raw mean scores and standard deviations for the attribute items that provided the basis for grouping attributes together in the mailback questionnaire. The frequency analysis also provided descriptive characteristics of the sample population. Cross-tabulation analyses (or contingency table analyses) were used to investigate associations between variables on the preliminary questionnaire. Tests for statistically significant differences (indicating an association or dependence between variables) using the chi-square statistic were produced through crosstabulation analyses.

Mailback Questionnaire

Frequency analyses were performed on the mailback questionnaire data to obtain general summary statistics (mean-scores for attribute and outcome items) and to describe the characteristics for the sample population. Cross-tabulation analyses were used to investigate associations between variables on the questionnaire that might not otherwise be detected and for general descriptive purposes.

Two types of cluster analytic techniques were used. Cluster analysis groups scaled items together based on their proximity in mathematical space. The ICLUST program (Revelle, 1977) is a hierarchical, scale construction and item analysis technique. ICLUST finds the matrix

of inter-item correlations, then finds the most similar pair of variables and forms a cluster. The program repeats these steps, treating successively formed clusters as if they were single variables. The program continues to add items to clusters until one of two indices (Cronbach's alpha or beta) of internal consistency fails to increase with the addition of an item. The cluster analysis for the attribute and outcome items identified clusters or groups of items that theoretically tap the same dimension.

Another cluster analysis technique, NORMIX (Wolfe, 1974) was used for the outcome items. This analysis produced types of wilderness users. NORMIX uses a minimum variance clustering on the basis of euclidean distances from each other. Maroon Bells-Snowmass Wilderness users were typed on the basis of their responses to the outcome items. Theoretically this grouped people together who desired similar outcomes from their wilderness experiences.

Type analysis was used on the attribute items, based on the number of points respondents assigned to the items. This analysis grouped wilderness users based on the important attributes of the setting that contributed to an individual's wilderness experience.

Relationships between outcome types and attributes were investigated using oneway analysis of variance. Analysis of variance has generally been used in previous studies using ratio scaling techniques (Bass et al., 1974). This type of analysis investigated the relationship between desired outcomes and desired settings. Posteriori tests, Student-Newman-Keuls, were used to find groups that differed when the analysis of variance F-test was significant.

Analyses of the attribute items was performed using two different mean scores. First, the raw mean scores for attribute items were used in the cluster analyses and analysis of variance. Then the logarithmic mean for each attribute item was used in the analyses.[11]

It is suggested that the analyses describe recreation experience opportunities that managers can provide by identifying which attributes of the setting are important in realizing desired outcomes. The results of these analyses are presented in the next chapter.

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[11] The transformation of raw mean scores to logarithmic mean scores has been suggested by several studies using ratio scaling (Guilford, 1954; Carroll, 1971; Bass, Cascio, and O'Connor, 1974). There is a curvilinear relationship between psychological perceived ratios and actual ratios (e.g., there is a curvilinear relationship between the perceived weight and actual weight (Stevens, 1962)). Logarithmic transformations are required to obtain linear relationships between psychologically perceived ratios and actual ratios.

CHAPTER IV

RESULTS

Of the 350 questionnaires mailed to Maroon Bells-Snowmass Wilderness users, 234 (67 percent) usable questionnaires were returned. Results from this questionnaire, user characteristics, desired psychological outcomes, and wilderness setting attributes are reported in this chapter.

User Characteristics

Two sections of the mailback questionnaire were used to collect data on user characteristics. Section I of the mailback questionnaire asked for users' previous wilderness experience, size of party on their last trip into the MBSW and users' satisfaction on their last trip into the MBSW. Section VI of the mailback questionnaire asked for demographic information from respondents, including age, sex, marital status, education, and size of the community where they resided. Demographic and experience information is shown in Table 4.

Three quarters (74 percent) of the respondents were male and 26 percent were female. Respondents to the mailback questionnaire were young (mean age 31-years-old) and well-educated. The average level of education completed was 16 years, comparable to a four-year college degree. Respondents were primarily urban dwellers, 43 percent resided in cities with populations over 100,000. Eighteen percent lived in towns between 25,000 and 99,999. Forty percent of the respondents resided in towns with populations less than 25,000.

Table 4. Demographic and wilderness experience information for all users of Maroon Bells-Snowmass Wilderness.

		All Users
Sex:	Male	74%
	Female	26%
Marital Status:	Single	55%
	Married	46%
Community Size:	100,000+	43%
	99,999 - 25,000	18%
	24,999 - 5,000	21%
	less than 5,000	16%
	farm	3%
		Means
Age		31.0
Education (years)		16.3
Number of wilderness/primitive areas visited		7.2
Number of trips into wilderness/primitive areas		17.8
Number of visits to Maroon Bells-Snowmass Wilderness		5.3
Number of people in party on last visit to MBSW		3.5

The MBSW respondents were an experienced wilderness group. The average number of different wilderness/primitive areas that respondents had visited in their lifetimes was seven. The average number of wilderness/primitive trips respondents had made in their lifetimes was 18. This number may be inflated since people sometimes cannot distinguish between wilderness areas and backcountry areas (American Forest Institute, 1977). Respondents were also experienced MBSW users. The mean number of trips into the MBSW for respondents was 5.3 trips.

As experienced MBSW users, respondents knew what to expect from their last trip into the MBSW. Most respondents (87 percent) indicated that their last trip into the MBSW was equal to or better than they expected. Thirty-five percent indicated that it was what they had expected and over half (52 percent) said that it was better than they expected. On a six-point scale ranging from disappointing (1) to ideal (6), respondents rated their last trip into the MBSW as almost equal to their idea of the ideal wilderness experience (5.3). Seventeen percent indicated it was equal to their ideal (6) wilderness experience and only 2 percent said that it was disappointing (1).

Desired Psychological Outcomes

Outcome Clusters

The ICLUST cluster analysis program produced fifteen outcome clusters from the 51 outcome items[12] on the mailback questionnaire. These represent groupings of psychological outcome items that tap similar psychological dimensions.

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[12]The first two items in the list of 53 outcomes were not coded to give respondents the opportunity to get used to the scale (Driver and Knopf, 1975).

Fourteen of these clusters, with cluster reliabilities ranging from .536 to .930, were used in further analyses. These clusters were Relationships with Nature/Scenery, Exploration, Exercise/Physical Fitness, Learn About Nature, Escape Social-Physical Pressure, Autonomy/Achievement, Privacy, Skills/Learning, Introspection, Family Togherness, Being with Friends/Similar People, Meeting-Observing New People, Risk Taking, and Leading Others.[13] The fifteenth cluster was dropped because the two items comprising the cluster ('resting physically' and 'avoiding the unexpected') did not represent an intuitively logical grouping and had a low cluster reliability (.411). In a second clustering attempt, these two items clustered with other groups, but were the last items to be joined to the respective clusters. Table 5 shows the items included in each cluster used in the analyses, the cluster reliability, and the cluster mean scores for all respondents.

The clusters in Table 5 are listed from highest to lowest in terms of the effect on respondents' wilderness experiences. Eleven clusters added to respondents' wilderness experiences (mean scores higher than 5.8) with Relationships with Nature/Scenery adding the most (mean 8.7). This cluster 'most strongly added to' (mean score above 8.5) respondents' wilderness experiences in the MBSW.

Three of the clusters had neutral effects on respondents' wilderness experiences. These clusters were Meeting-Observing New People (mean 5.8), Risk Taking (mean 5.4) and Leading Others (mean 4.8). There was a natural break between these three clusters and the other clusters. The

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[13]The correlations between clusters and shown in Appendix F.

Table 5. Maroon Bells-Snowmass Wilderness user outcome clusters, outcome item means, standard deviations, and cluster reliabilies.

Outcome Clusters	All Users Mean[a]	All Users S.D.	Cluster Reliability
Relationships with Nature/Scenery	8.6	.6	.826
Viewing the scenic beauty			
Viewing the scenery			
Enjoying the sounds and smells of nature			
Exploration	8.0	.8	.605
Experience new and different things			
Having a change from daily routine			
Exercise/Physical Fitness	8.0	1.0	.820
Keeping physically fit			
Getting exercise			
Learn About Nature	7.9	.9	.830
Learning more about things here			
Learning more about nature			
Study nature			
Being close to nature			
Escape Social-Physical Pressure	7.9	1.0	.806
Being away from the noise back home			
Getting away from the usual demands			
Releasing tensions			
Experiencing the elbow room			
Tranquility			
Giving your mind a rest			
Autonomy/Achievement	7.3	.9	.872
Being free to make your own choices			
Being your own boss			
Feeling your independence			
Becoming better at it			
Gaining a sense of self-confidence			
Learning what you are capable of			
Privacy	7.2	1.3	.536
Feeling isolated			
Being on your own			

Table 5 (cont.)

Outcome Clusters	All Users Mean[a]	All Users S.D.	Cluster Reliability
Skills/Learning	7.1	.9	.625
Testing and using your equipment			
Testing your abilities			
Getting to know the lay of the land			
Experiencing the excitement			
Developing skills and abilities			
Introspection	6.9	1.3	.742
Thinking about the good times you have had in the past			
Thinking about who you are			
Thinking about your personal values			
Family Togetherness	6.8	1.3	.930
Doing something with your family			
Bringing the family closer together			
Being with Friends/Similar People	6.8	1.1	.797
Being with friends			
Being with others who enjoy the same things you do			
Sharing what you have learned with others			
Being with other members of your group			
Teaching your outdoor skills to others			
Meeting-Observing New People	5.8	1.3	.815
Being near others who could help			
Knowing others are nearby			
Being near considerate people			
Talking to new and varied people			
Observing other people			
Risk Taking	5.4	2.0	.905
Taking risks			
Chancing dangerous situations			
Leading Others	4.8	1.5	.650
Helping direct the activities of others			
Showing others you could do it.			

[a]Means are based on a 9-point scale from 'most strongly adds to' (9) to 'most strongly detracts from' (1).

point difference (1.0) between the first of these neutral clusters (Meeting-Observing New People - 5.8) and the last cluster that added to respondents' wilderness experience (Being with Friends/Similar People - 6.8) was the largest separation between adjacent clusters.

Types of Maroon Bells-Snowmass Wilderness Users

The outcome cluster mean scores were used in the NORMIX cluster program to group MBSW respondents into types. Eight NORMIX analyses were performed, gradually reducing the number of outcome clusters used to type respondents. Generally, the outcome clusters with the largest standard deviations were retained in successive NORMIX analyses. The final NORMIX analysis used eight clusters[14] and resulted in defining four types of MBSW respondents. The likelihood that there were four types of users rather than three types was accepted at the .06 significance level. This level of significance was accepted because most of the NORMIX analyses, using different numbers of clusters, produced four types of respondents at the traditionally accepted .05 level or below. The NORMIX analyses using only eight clusters was selected for the typing of respondents because it resulted in the greatest differentiation between types and the least number of individuals who could not be typed. Twelve respondents could not be typed, thus, the following discussion includes only 222 respondents.

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[14]These eight clusters were Meeting-Observing/Being Near New People, Introspection, Escape Physical-Social Pressure, Being with Friends/Similar People, Privacy, Leading Others, Family Togetherness, and Risk Taking.

The cluster means and standard deviations for each of the four types of respondents are shown in Table 6.[15] Figure 6 is a graphic representation of these cluster means for each type. A discussion of the psychological profiles for each type of MBSW user follows. Since Relationships with Nature/Scenery is so highly valued by all types, this cluster is omitted from the following discussion.

Type 1 included 34 members and, generally, had higher cluster mean scores than the other groups. Type 1 respondents were notably high (strongly adds to) on the Privacy (8.3) and Introspection (8.3) clusters. Type 1 individuals had a high cluster mean on Family Togetherness (8.2 - strongly adds). Type 1 respondents had the highest cluster mean on other social clusters, Being with Friends/Similar People (7.1) and Meeting-Observing New People (5.8), although this is just within the 'slightly adds to' category. Leading Others (5.0) and Risk Taking were the only clusters that neither added to nor detracted from Type 1 respondents' wilderness experiences.

Type 2 respondents (51 individuals) had more variability in their responses to the outcome clusters than Type 1 respondents. Type 2 respondents had the highest cluster mean (8.3) for Family Togetherness second only to Relationships with Nature/Scenery (8.8). Exploration, Exercise, and Escape Social-Physical Pressure all 'strongly added to' (mean about 7.5) Type 2 wilderness experiences. Type 2 respondents had their lowest cluster mean on Risk Taking (4.1) which slightly detracted from their wilderness experience. This was the lowest cluster mean score for any cluster.

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[15] Individual item means, standard deviations, and sample sizes for these cluster items for each type are shown in Appendix G.

Table 6. Outcome cluster and outcome item means[a] and standard deviations for four types of wilderness users from the Maroon Bells-Snowmass Wilderness. Clusters with asterisks (*) were used in NORMIX analysis that typed MBSW users.

Outcome Clusters	Type 1 N=34 Cluster Mean	S.D.	Type 2 N=51 Cluster Mean	S.D.	Type 3 N=35 Cluster Mean	S.D.	Type 4 N=98 Cluster Mean	S.D.
Relationships with Nature/Scenery	8.7	.5	8.8	.7	8.5	1.5	8.6	.5
Viewing the scenic beauty								
Viewing the scenery								
Enjoying the sounds and smells of nature								
Exploration	8.2	.9	8.2	.8	7.2	1.0	8.3	.7
Experience new and different things								
Having a change from daily routine								
Exercise/Physical Fitness	8.5	.6	8.0	.9	7.2	.9	8.2	.9
Keeping physically fit								
Getting exercise								
Learn About Nature	8.5	.6	8.0	.8	7.0	1.0	8.0	.8
Learning more about things here								
Learning more about nature								
Study nature								
Being close to nature								
Escape Social-Physical Pressure*	8.0	.8	7.9	.6	6.8	1.0	7.9	.6
Being away from the noise back home								
Getting away from the usual demands								
Releasing tensions								
Experiencing the elbow room								
Tranquility								
Giving your mind a rest								
Autonomy-Achievement	8.0	.9	7.2	1.0	6.4	1.0	7.5	1.0
Being free to make your own choices								
Being your own boss								
Feeling your independence								
Becoming better at it								
Gaining a sense of self-confidence								
Learning what you are capable of								
Privacy *	8.3	.6	6.7	1.4	6.9	1.3	7.2	1.4
Feeling isolated								
Being on your own								

Table 6 (cont.)

Outcome Clusters	Type 1 N=74 Cluster Mean	S.D.	Type 2 N=51 Cluster Mean	S.D.	Type 3 N=35 Cluster Mean	S.D.	Type 4 N=98 Cluster Mean	S.D.
Skills/Learning	7.6	.9	6.9	.9	6.6	.9	7.3	.9
Testing and using your equipment Testing your abilities Getting to know the lay of the land Experiencing the excitement Developing skills and abilities								
Introspection*	8.3	.6	6.4	1.2	5.8	1.0	7.1	1.2
Thinking about the good times you have had in the past Thinking about who you are Thinking about your personal values								
Family Togetherness*	8.2	.9	8.3	.7	6.0	1.4	5.8	1.8
Doing something with your family Bringing the family closer together								
Being with Friends/Similar People*	7.1	1.7	6.9	1.1	6.0	1.0	7.0	.8
Being with friends Being with others who enjoy the same things you do Sharing what you have learned with others Being with other members of your group Teaching your outdoor skills to others								
Meeting-Observing New People*	5.8	1.6	5.3	1.3	4.8	.9	5.7	1.3
Being near others who could help Knowing other are nearby Being near considerate people Talking to new and varied people Observing other people								
Risk Taking*	5.4	2.3	4.1	1.2	5.0	1.8	6.4	1.5
Taking risks Chancing dangerous situations								
Leading Others*	5.0	2.3	4.3	1.3	4.8	1.2	4.9	1.5
Helping direct the activities of others Showing others you could do it								

[a]Means are based on a 9 point scale from 'most strongly adds to' (9) to 'most strongly detracts from' (1).

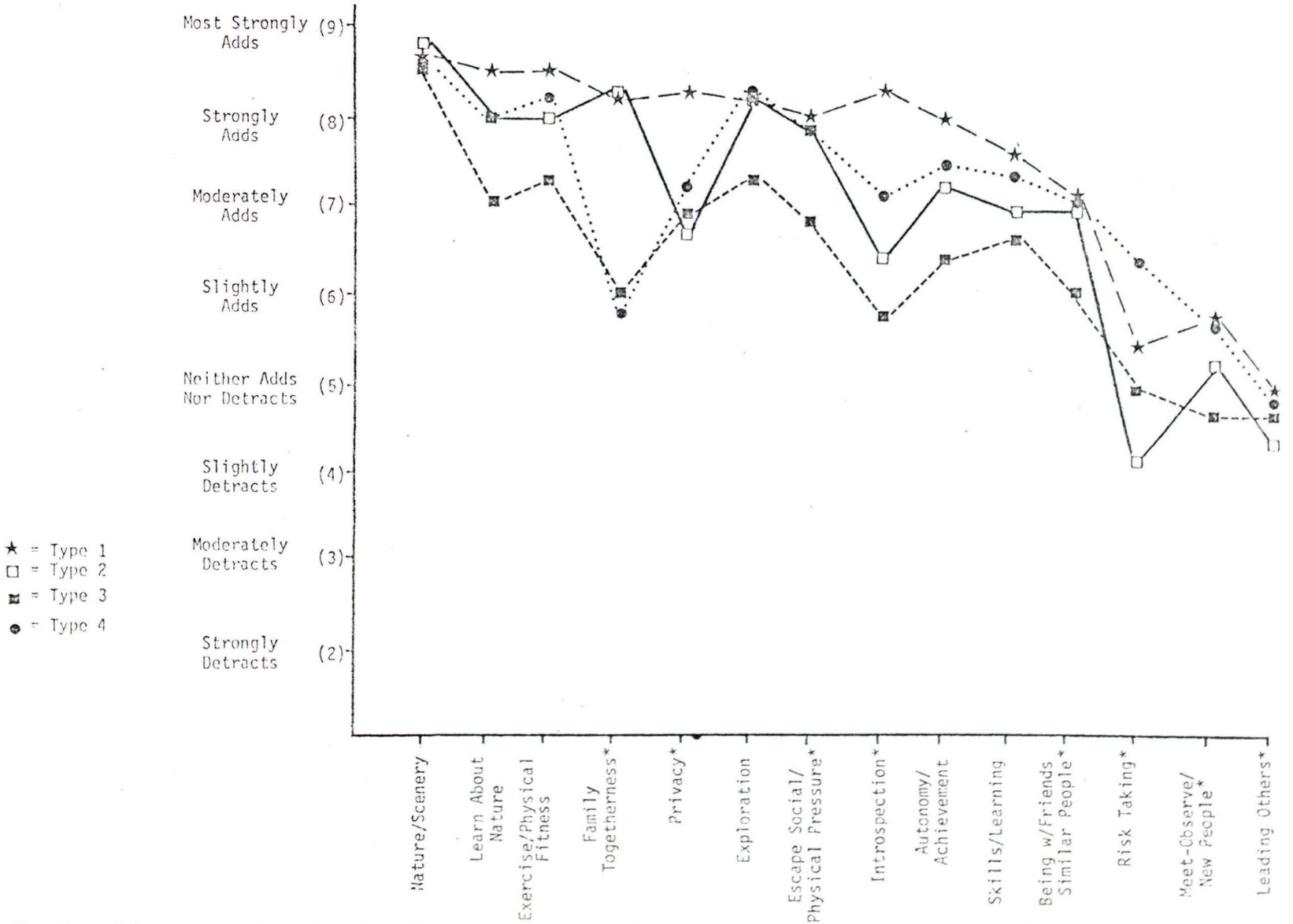

Figure 6. Graphic representation of cluster means for the four types of respondents from the Maroon Bells-Snowmass Wilderness area. Clusters marked with asterisks (*) were used to type respondents.

Type 3 respondents included 34 individuals and generally had the lowest cluster mean scores. These individuals had the lowest cluster mean scores for all but four of the outcome clusters. Relationship with Nature/Scenery was the only cluster that 'strongly added to' (8.5) Type 3 respondents' wilderness experiences. Exercise (7.2), Learn About Nature (7.0), Exploration (7.2), Privacy (6.9), and Escape Social-Physical Pressure (6.8) 'moderately added to' Type 3 respondents' wilderness experiences. Social outcome clusters were not particularly desirable to Type 3 respondents. Being with Friends/Similar People (6.0), Family Togetherness (6.0), and Meeting-Observing New People (4.8) were not highly rated by Type 3 wilderness users.

Type 4 was the largest group, including 99 individuals or 42 percent of the sample. Exercise (8.2), Exploration (8.3), Learn About Nature (8.0) and Escape Social-Physical Pressure (7.9) all 'strongly added to' type 4 wilderness experiences. Type 4 respondents had the highest cluster mean on Risk Taking (6.4). Type 4 respondents also had the lowest cluster mean on Family Togetherness (5.8). Being with Friends/Similar People (7.0) 'moderately added to' Type 4 wilderness experiences while out-group affiliations, Meeting-Observing New People (5.7) only slightly added to their wilderness experiences.

Demographic Characteristics of Four Types of Users

Demographic and wilderness experience information for the respondents in each type are shown in Table 7. The analysis of variance F statistic was used to detect any statistically significant differences between user types. The only variables that resulted in significant differences

Table 7. Demographic and wilderness experience information for four types of Maroon Bells-Snowmass Wilderness users. Analysis of variance, F-tests and Student-Newman-Keuls differences between types.

		Type 1 %	Type 2 %	Type 3 %	Type 4 %	ANOVA F-Ratio	Groups That Differ
Sex:***	Male	56	76	94	72	4.65	3-1, 4
	Female	44	24	6	28		
Marital Status:**	Single	44	22	59	72	13.98	2-1, 3, 1-4
	Married	56	78	41	28		
Community Size:*	100,000+	26	31	50	57	3.56	1-4
	99,999-25,000	15	27	12	13		
	24,999-5,000	29	23	23	14		
	less than 5,000	26	16	9	15		
	farm	3	2	6	1		
				Means			
Age***		32.4	36.4	32.0	27.0	11.51	4-1, 2, 3
Education (years)		16.2	16.3	16.8	16.2	.45	
Number of wilderness/primitive areas visited		6.7	7.8	7.2	7.4	.10	
Number of trips into wilderness/primitive areas		14.6	17.4	22.3	16.9	1.05	
Number of visits to Maroon Bells-Snowmass Wilderness		3.5	6.5	6.1	4.8	.85	
Number of people on last visit to MBSW		3.6	3.3	4.5	3.4	1.33	

*** .001 significance.

** .01 significance.

* .05 significance.

between types were sex, marital status, community size, and age. Posteriori comparisons (Student-Newman-Keuls test) were made on these variables to investigate which groups differed. The results of these tests are also shown on Table 7. The distinguishing characteristics of each type are discussed below.

Type 1 had the largest percentage of females (44 percent) among the four types. Type 1 respondents were slightly older (32-years-old) than the average MBSW user and 56 percent of Type 1 respondents were married. Respondents in Type 1 were generally from small towns and rural areas. This group had the largest percentage (58 percent) of individuals who resided in communities of less than 25,000 people. Three quarters (76 percent) of Type 2 respondents were males. This group had the highest percentage of married people (78 percent) and were the oldest group of respondents (mean age--36.4 years old). Fifty-eight percent of Type 2 respondents resided in communities of over 25,000. Type 3 respondents were a predominantly male group (94 percent) and 59 percent of Type 3 individuals were single. This group was an urban dwelling group with half of Type 3 respondents (50 percent) living in communities of 100,000 or more people. Type 4 respondents were the youngest group with an average age of 27 years old. Type 4 individuals were three-quarters (72 percent) male and had the highest percentage of single individuals (72 percent). More individuals in Type 4 (57 percent) were from cities over 100,000 people than any other type.

Type 3 differed from Types 1 and 4 on sex at the .001 level of significance. Type 3 was the predominantly male group (94 percent) and Types 1 and 4 had larger percentages of females (44 percent and 28 percent respectively).

Type 2 differed from Types 1, 3, and 4 on marital status at the .01 level. Type 2 respondents had the largest percentage of married individuals (78 percent). Marital status also distinguished between Types 1 and 4. Type 4 had the largest percentage of single individuals (72 percent) and Type 1 was almost equally divided between single (44 percent) and married (56 percent). Types 1 and 4 also differed from each other on community size at the .05 level of significance. Type 4 individuals had the largest percentage of urban dwellers (57 percent) and Type 2 had the largest percentage of people residing in communities of less than 25,000 (58 percent). The last statistically significant difference was in age. Type 4 differed from Types 1, 2, and 3 at the .001 level. Type 4 was the youngest group (27 years old), while the other groups were 32 and 36 years old. Analyses of education, previous wilderness experience, and number of people per party did not result in statistically significant differences between types.

Important Setting Attributes

The six groups of attributes on the mailback questionnaire were grouped together based on similar means. The first two groups were designated highly valued attribute groups (groups 1 and 2), groups 3 and 4 were moderately valued attributes and groups 5 and 6 were negatively valued attribute groups. The importance ratings for attributes in which the most important attribute in a group was scored 100 points are shown in Table 8. For attribute groups 1, 2, 3, and 4, the highest mean score represents that attribute which is most important for that group. For attribute groups 5 and 6, the highest mean score represents that item in a group that was the least desirable (or worst) item.

Table 8. Means[a] and standard deviations for attribute items of all users of Maroon Bells-Snowmass Wilderness users.

Variable	All Users Mean	S.D.
Group 1	65.4	13.8
Slow moving streams with deep holes	52.0	28.9
Camping with no one in sight or hearing range	89.3	18.2
Knowing where the crowded areas of the wilderness are	68.4	26.0
Bighorn sheep	57.6	27.2
Seeing no one else, except the members of your group for 2-3 days	69.5	28.4
Lakes with no trails to them	55.8	27.3
Group 2	63.8	12.9
Not meeting any other groups during the day	68.3	29.8
Knowing the regulations that govern an area	62.7	27.7
The presence of beaver	63.1	25.8
Considerate people	87.4	18.7
Accurate maps of campsites	60.1	30.9
Boulder fields	41.3	26.3
Group 3	51.3	15.9
Few signs in the wilderness	73.8	30.7
Unpredictable weather	42.5	31.5
Briefly chatting with others at your campsite	39.0	29.1
Bridges placed over dangerous stream crossings	67.3	33.1
Gently rolling topography	42.0	32.0
Briefly chatting with others along the trail	42.0	29.3

Table 8 (cont.)

Variable	All Users	
	Mean	S.D.
Group 4	46.1	39.8
Rock slides	44.8	46.3
Long conversations with others at your campsite	35.9	32.0
Well-maintained trails free of obstacles	60.3	50.0
Evidences of forest fires	31.0	27.7
Camping within sight of 1-2 parties which are out of hearing range	35.6	39.8
Trail signs with destination mileages	61.6	36.3
Group 5	61.7	61.5
Pets on leashes	59.6	34.5
Firerings at campsites	51.9	53.4
Dead vegetation around campsites	70.3	56.8
Meeting a party of six or more on horseback during the day	69.7	32.9
Seeing domestic livestock	50.5	34.0
Shortcut trails between switchbacks	65.3	64.5
Group 6	66.5	31.0
Long strings of pack animals	71.2	37.0
Deeply eroded trails	74.4	54.2
Brightly colored equipment	32.1	27.7
Campsites that are close together	81.2	46.7
Seeing stripped or damaged trees	85.5	51.1
Someone walking through your campsite	75.9	22.4

[a]Means are based on a 100 point scale for groups 1, 2, 3, and 4. The highest score indicates the most important attribute. For groups 5 and 6, the highest score indicates the least desirable attribute.

Table 9 divides the attribute groups into high, moderate, and negative groups. The attributes within these classifications are ordered from highest to lowest. The higher the score in the high and moderate groups, the more important that attribute is in the wilderness environment. The higher the score in the negative group, the less desirable that attribute is in the wilderness environment. In general, the high group had smaller standard deviations than the other groups. The ratio scores were lower in the moderate and negative groups, but there was greater variability of responses as indicated by the larger standard deviations.

In the high group of attributes, four of the top five attributes were the social attributes. Camping with no one in sight or hearing range had the highest overall ratio score mean for any attribute (89.3) and Considerate people (87.4) was next. The top two social items were 18 to 20 points higher than the next most important attribute (Seeing no one else except the members of your group for 2-3 days). Managerial attributes appear in the middle of the high group ranging from 68.4 (Knowing where the crowded areas of the wilderness are) to 55.8 (Lakes with no trails to them). Physical attributes were rated in the middle and low ranges of the high group. Two physical items have the lowest scores in the high group--Slow moving streams with deep holes (41.3) and Boulder fields (52.0). These items had almost half (30 to 40 points below) the ratings of the social items.

In the moderate group of attributes, managerial items were clearly the most important. Few signs in the wilderness (73.8), Bridges placed over dangerous stream crossings (67.3), Trail signs with destination

Table 5. Rank order of attribute items based on high, moderate and negative groups of items for Maroon Bells-Snowmass Wilderness users.

	Attribute Item	Attribute Type	Mean[a]	S.D.
High (Groups 1 & 2)	Camping with no one in sight or hearing range	Social	89.5	19.2
	Considerate people	Social	87.4	18.7
	Seeing no one else, except the members of your group for 2-3 days	Social	69.8	28.4
	Knowing where the crowded areas of the wilderness are	Managerial	68.4	26.0
	Not meeting any other groups during the day	Social	68.3	29.8
	The presence of beaver	Physical	63.1	25.8
	Knowing the regulations that govern an area	Managerial	62.7	27.7
	Accurate maps of campsites	Managerial	60.1	30.9
	Bighorn sheep	Physical	57.6	27.2
	Lakes with no trails to them	Managerial	55.8	27.3
	Slow moving streams with deep holes	Physical	52.0	28.6
	Boulder fields	Physical	41.3	26.3
Moderate (Groups 3 & 4)	Few signs in the wilderness	Managerial	75.8	30.7
	Bridges placed over dangerous stream crossings	Managerial	67.3	33.1
	Trail signs with destination mileages	Managerial	61.6	36.3
	Well-maintained trails free of obstacles	Managerial	60.3	30.0
	Rock slides	Physical	44.8	46.3
	Unpredictable weather	Physical	42.5	(35.1)
	Gently rolling topography	Physical	42.0	30.0
	Briefly chatting with others along the trail	Social	42.0	29.3
	Briefly chatting with others at your campsite	Social	33.0	(29.2)
	Camping within sight of 1-2 parties which are out of hearing range	Social	36.6	39.8
	Long conversations with others at your campsite	Social	35.0	32.0
	Evidences of forest fires	Physical	31.0	27.7
Negative (Groups 5 & 6)	Seeing stripped or damaged trees	Physical	87.5	46.7
	Campsites that are close together	Managerial	82.2	51.1
	Someone walking through your campsite	Social	75.9	27.4
	Deeply eroded trails	Physical	74.5	54.3
	Dead vegetation around campsites	Physical	71.3	56.8
	Long strings of pack animals	Managerial	71.2	37.0
	Meeting a party of six or more on horseback during the day	Social	65.7	32.3
	Shortcut trails between switchbacks	Physical	65.3	64.5
	Pets on leashes	Social	59.6	34.5
	Firerings at campsites	Managerial	51.9	53.4
	Seeing domestic livestock	Managerial	50.5	34.0
	Brightly colored equipment	Social	32.1	27.7

[a]Means are based on a 100 point scale for groups 1, 2, 3, and 4. The highest score indicates the most important attribute. For groups 5 and 6, the highest score indicates the least desirable attribute.

mileages (61.6) and Well-maintained trails (60.3) were 20 to 30 points above the next highest rated items in the moderate group. Three physical items are rated next most important, Rock slides (44.8), Unpredictable weather (42.5), and Gently rolling topography (42.0). The three physical items were rated similarly, having scores within two points of each other. The social items in the moderate group were the lowest rated group, Briefly chatting with others along the trail (42.0), Briefly chatting with others at your campsite (39.0), Camping in sight of 1-2 parties, out of hearing range (35.6) and Long conversations with others at your campsite (35.0). These social attributes were 20 to 25 points below the managerial items but only three to seven points below the physical items. The lowest item in the moderate group was a physical item (Evidences of forest fires - 31.0).

There is no one type of attribute that dominated the top of the list in the negative group. Three of the top five items were physical attributes (Seeing stripped or damaged trees (87.5), Deeply eroded trails (75.9), Dead vegetation around campsites (71.3)). The least desirable item (the item with the highest mean) was a physical item, Seeing stripped or damaged trees. Social and managerial attributes were not clustered together as in the high and moderate groups, but appeared throughout the ranking of negative attributes. A managerial attribute (Campsites that are close together -82.2) and a social item (Someone walking through your campsite - 75.9) were rated as two and three overall in the negative group. The negative item with the lowest score (not as undesirable as the other items) was a social item (Brightly colored equipment--32.1).

User responses to attribute items were analyzed by the user types established by the NORMIX outcome cluster analysis. The means and standard deviations for each attribute item for each user type are shown in Table 10.

Oneway analysis of variance of the attribute items, revealed only two attributes that were significantly different at the .05 level (Table 11).[16] These differences between user types were between Type 1 and Type 4 on Not meeting any other groups during the day at the .03 level. Type 1 users gave it the highest score (78.2) and Type 4 gave the lowest score (62.7). Type 3 differed from Types 1, 2, and 4 on Accurate maps of sampsites. Type 3 gave that attribute the lowest mean score, (42.6) 20 points lower than the rating this attribute received from other types.

Three other attributes had analysis of variance F-test scores that were significant under the .10 level, Bighorn sheep had an F-test probability of .07, Seeing only the members of your group for 2-3 days - .05, but Long conversations with others at your campsite -.07. However, posteriori tests of these attributes at the .10 level, did not reveal any differences between the types on these attributes. Therefore, these attributes are not shown as statistically significant differences in Table 11.

Logarithm scores for the 36 attribute items yielded only two statistically significant differences between types. The first difference was on Accurate maps of campsites (.05 difference) in which

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[16]Rank ordering of attribute types for each of the six groups of attributes produced no noticeable differences between user types. The four types ranked the attributes similarly. The results of this tabulation are shown in Appendix H.

Table 10. Means[a] and standard deviations for attribute items of four types of Maroon Bells-Snowmass Wilderness users.

Variable	Type 1		Type 2		Type 3		Type 4	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Group 1								
Slow moving streams with deep holes	55.4	25.8	51.5	28.7	49.2	26.3	51.1	30.6
Camping with no one in sight or hearing range	90.1	15.1	92.1	16.3	87.1	15.3	88.8	21.0
Knowing where the crowded areas of the wilderness are	74.0	25.7	67.8	28.3	63.0	28.9	68.3	24.0
Bighorn sheep	64.3	22.6	60.9	27.5	48.0	30.0	56.1	26.9
Seeing no one else, except the members of your group for 2-3 days	75.4	26.8	64.3	32.8	78.9	22.6	66.8	27.7
Lakes with no trails to them	54.5	26.2	58.1	28.7	54.7	28.6	56.7	25.6
Group 2								
Not meeting any other groups during the day	78.2	23.7	68.6	31.5	74.5	26.6	62.7	31.0
Knowing the regulations that govern an area	70.2	27.9	58.0	29.5	57.1	27.1	63.5	26.8
The presence of beaver	66.1	24.3	66.5	26.1	57.4	28.4	62.2	25.3
Considerate people	88.2	15.3	86.5	21.7	83.5	23.4	89.7	14.1
Accurate maps of campsites	64.4	30.4	63.2	32.1	42.6	24.4	65.4	29.9
Boulder fields	46.5	24.9	38.5	26.3	33.7	22.4	43.9	26.9
Group 3								
Few signs in the wilderness	77.4	26.4	75.9	29.7	63.5	32.5	73.9	31.9
Unpredictable weather	48.6	33.6	49.5	33.7	35.0	26.9	39.5	28.0
Briefly chatting with others at your campsite	42.0	30.1	37.9	30.6	33.8	28.1	42.2	28.7
Bridges placed over dangerous stream crossings	68.1	31.8	67.7	32.8	64.1	37.7	70.5	31.3
Gently rolling topography	42.1	25.3	41.6	33.7	38.1	31.0	43.1	32.5
Briefly chatting with others along the trail	42.2	26.4	43.2	31.7	38.1	28.8	44.3	28.8

Table 10, cont.

Variable	Type 1		Type 2		Type 3		Type 4	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Group 4								
Rock slides	42.0	33.0	43.7	37.1	45.9	37.5	40.5	32.8
Long conversations with others at your campsite	32.0	35.1	25.5	25.7	39.3	30.1	39.7	33.3
Well-maintained trails free of obstacles	55.8	32.6	59.0	38.8	50.4	35.3	62.2	32.9
Evidences of forest fires	36.9	27.1	27.1	26.8	34.8	29.8	28.5	26.1
Camping within sight of 1-2 parties which are out of hearing range	30.3	29.1	45.0	33.5	31.6	23.3	35.7	31.8
Trail signs with destination mileages	71.7	31.5	65.9	36.0	51.9	38.0	62.1	35.6
Group 5								
Pets on leashes	59.3	33.3	59.4	36.4	60.5	38.2	60.5	32.5
Firerings at campsites	49.3	31.3	46.1	33.8	46.5	31.6	51.6	29.6
Dead vegetation around campsites	83.1	17.6	65.9	32.9	57.3	43.3	65.6	28.8
Meeting a party of six or more on horseback during the day	73.0	30.3	64.8	33.3	61.3	13.8	71.1	31.9
Seeing domestic livestock	49.4	31.8	55.5	33.4	43.9	16.7	48.5	32.9
Shortcut trails between switchbacks	60.5	32.0	63.7	30.4	61.4	49.6	58.2	33.8
Group 6								
Long strings of pack animals	77.0	25.6	74.2	27.6	61.5	22.0	66.0	31.3
Deeply eroded trails	75.7	21.1	70.6	27.0	65.0	42.5	70.4	24.8
Brightly colored equipment	39.4	26.8	32.7	28.6	31.6	27.9	29.7	26.4
Campsites that are close together	81.2	21.1	84.4	20.1	66.4	37.8	80.2	22.5
Seeing stripped or damaged trees	86.3	21.3	80.0	23.3	80.7	42.5	86.5	15.4
Someone walking through your campsite	76.3	25.0	81.0	29.3	74.8	20.9	73.3	29.7

[a]Means are based on a 100 point scale for groups 1, 2, 3, and 4. The highest score indicates the most important attribute. For groups 5 and 6, the highest score indicates the least desirable attribute.

Table 11. Analysis of variance F-statistics and Student-Newman-Keuls results for four types of Maroon Bells-Snowmass Wilderness area users.

Attribute Item	ANOVA F	Types That Differ
Group 1		
Slow moving streams with deep holes	.2800	
Camping with no one in sight or hearing range	.5952	
Knowing where the crowded areas of the wilderness are	.9913	
Bighorn sheep	2.4119	
Seeing no one else, except the members of your group for 2-3 days*	2.6069	?-3
Lakes with no trails to them	.1378	
Group 2		
Not meeting any other groups during the day*	2.9134	4-1
Knowing the regulations that govern an area	1.7266	
The presence of beaver	1.0053	
Considerate people	1.0845	
Accurate maps of campsites*	5.1648	3-1,2,4
Boulder fields	1.9132	
Group 3		
Few signs in the wilderness	1.4544	
Unpredictable weather	2.0633	
Briefly chatting with others at your campsite	.8117	
Bridges placed over dangerous stream crossings	.3401	
Gently rolling topography	.2140	
Briefly chatting with others along the trail	.3688	
Group 4		
Rock slides	1.6162	
Long conversations with others at your campsite	2.3772	
Well-maintained trails free of obstacles	.3741	
Evidences of forest fires	1.2743	
Camping within sight of 1-2 parties which are out of hearing range	.6172	
Trail signs with destination mileages	1.8879	
Group 5		
Pets on leashes	.0178	
Firerings at campsites	.7823	
Dead vegetation around campsites	1.9377	
Meeting a party of six or more on horseback during the day	.5812	
Seeing domestic livestock	.4757	
Shortcut trails between switchbacks	1.7138	
Group 6		
Long strings of pack animals	1.0210	
Deeply eroded trails	.9821	
Brightly colored equipment	1.0374	
Campsites that are close together	.2124	
Seeing stripped or damaged trees	1.5023	
Someone walking through your campsite	.8749	

*Statistically significant differences.

Type 3 differed from Types 1, 2, and 4. The second difference was on Long conversations with others at your campsite. While this attribute showed a statistically significant F-test, posteriori Student-Newman-Keuls tests did not show any differences between groups.

The 36 attributes were aggregated into two groups to see if the combined effect of the kinds of attributes would produce differences between types that would not be detected in individual analysis.

First the attribute items were grouped into 18 variables, two items per variable (Table 12), each of the 18 variables containing the two like variables (i.e., two social attributes, two physical attributes, two managerial attributes) from each of the six groups. Raw data analysis of these 18 variables revealed statistically significant differences on high management items, Knowing the regulations that govern an area - Accurate maps of campsites, Type 3 differed from Types 1, 2, and 4. Rock slides - Evidences of forest fires (moderate physical attributes) and negative management items, Campsites that are close together - Long strings of pack animals, also resulted in Type 3 differing from Types 1, 2, and 4. No differences were found using the logs of these 18 variables. Combining these variables did reveal differences that did not add to the explanation of differences between groups.

Further aggregating the attributes into nine variables did not reveal any other differences between groups. Four like items were combined into one variable (e.g., four social items from the high group, four social items from the moderate group, and four social items from the negative groups all equal one variable).

Table 12. Attribute item membership for analysis of eighteen attribute variables (two items each) and nine attribute variables (four items each)--means[a] and standard deviations.

	Raw Data	Type 1	S.D.	Type 2	S.D.	Type 3	S.D.	Type 4	S.D.
Camping with no one in sight or hearing range Seeing no one else, except the members of your group for 2-3 days	Social high 1	84.8	16.8	70.2	20.2	83.0	14.5	77.8	18.8
Not meeting any other groups during the day Considerate people	Social high 2	83.2	13.1	77.5	16.4	79.0	16.6	75.9	15.3
Slow moving streams with deep holes Bighorn sheep	Physical high 1	60.3	19.7	56.2	22.5	48.6	21.2	53.6	21.6
The presence of beaver Boulder fields	Physical high 2	56.1	21.2	52.5	21.4	45.6	19.7	54.1	21.8
Knowing where the crowded areas of the wilderness are Lakes with no trails to them	Management high 1	64.2	18.1	60.9	23.3	58.8	13.8	62.5	17.9
Knowing the regulations that govern an area* Accurate maps of campsites	Management high 2	67.3	21.0	60.6	26.3	49.8	20.7	64.5	21.8
Briefly chatting with others at your campsite Briefly chatting with others along the trail	Social moderate 1	42.1	25.5	40.6	29.2	36.0	21.8	43.2	25.7
Long conversations with others at your campsite Camping within sight of 1-2 parties which are out of hearing range	Social moderate 2	30.2	25.0	31.1	24.7	48.7	82.6	37.6	26.4
Unpredictable weather Gently rolling topography	Physical moderate 1	41.7	20.8	46.8	25.3	36.5	22.2	41.8	21.4
Rock slides Evidences of forest fires*	Physical moderate 2	39.9	25.9	35.0	26.1	57.4	101.3	34.6	26.1
Few signs in the wilderness Bridges placed over dangerous stream crossings	Management moderate 1	72.7	18.7	71.3	18.8	63.2	24.9	72.2	19.2
Well maintained trails free of obstacles Trail signs with destination mileages	Management moderate 2	61.8	21.3	61.7	30.1	66.0	90.3	62.2	26.9
Pets on leashes Meeting a party of six or more on horseback during the day	Social negative 1	65.5	22.1	67.1	28.4	66.8	32.4	65.8	22.7
Brightly colored equipment Someone walking through your campsite	Social negative 2	57.2	20.7	59.2	33.2	53.2	20.3	51.5	22.0
Dead vegetation around campsites Shortcut trails between switchbacks	Physical negative 1	71.8	19.1	64.8	23.5	64.3	24.1	61.8	25.2
Deeply eroded trails Seeing stripped or damaged trees	Physical negative 2	81.0	17.8	75.7	19.1	75.0	16.0	78.4	15.6
Firerings at campsite Seeing domestic livestock	Management negative 1	66.3	16.4	60.7	23.3	56.2	20.3	57.0	23.8
Long strings of pack animals* Campsites that are close together	Management negative 2	79.1	14.3	79.3	19.4	65.9	20.1	73.1	17.7

*Statistically significant differences .05 level.

[a]Means are based on a 100 point scale for groups 1, 2, 3, and 4.

These nine variables revealed differences in the management high group (Knowing where the crowded areas of the wilderness area, Lakes with no trails to them, Knowing the regulations that govern an area, Accurate maps of campsites) between Type 3 and Types 1, 2, and 4. The same differences were found using the logarithm of these items.

Aggregating attribute items into groups did not reveal differences that were not found from analyzing the 36 variables separately. Also logarithm scores did not produce very different results from the raw data scores.

The interpretation of these results is discussed in the next chapter. Implications for management and the importance of using a ratio scaling system are presented.

CHAPTER V

DISCUSSION AND SUMMARY

One limitation in the interpretation of these results is that the sample of Maroon Bells-Snowmass Wilderness users was not a random sample. This research was an exploratory attempt at using a new method of collecting information on the setting preferences of wilderness recreationists. Therefore, a random sample was not a requirement of this research. This aspect of the study should be considered when interpreting the results.

Maroon Bells-Snowmass Wilderness Users--A Summary

The general characteristics of the respondents to the MBSW questionnaire correspond to the characteristics of wilderness users in other areas (Hendee et al., 1968; Lucas, 1964). The Maroon Bells-Snowmass respondents were young and well educated. This group of respondents was very experienced in wilderness areas and particularly experienced in the MBSW. This high level of wilderness experience lends credence to the responses of those surveyed. Lawler (1973) points out that expectancies are reality based, therefore the more experience individuals have in particular situations, the more accurate are the expectancies.

Using desired recreation experiences as criteria, the MBSW respondents were categorized into four types of users. The one preference that all four types had in common was the rating of

Relationships with Nature/Scenery as the outcome that added the most to their wilderness experience. This particular area of the Rocky Mountains is well-known for its spectacular scenery and has been typified in tourist literature as the Crown of the Rockies. It is not surprising that enjoying the scenery was the most desired outcome for all users.

Type 1 users value outcomes that have typically been used to describe the traditional wilderness user. Privacy and Introspection were highly valued outcomes, while being with other people generally was not valued. This group represented a smaller segment of the total sample (15 percent) than might be expected. Type 1 was less experienced than the other groups which might explain their higher responses. With less experience, what Type 1 expected might not correspond to what actually could be provided by the MBSW area.

Type 2 was a family-oriented group. This group was older and had the highest percentage of married people. Type 2 people were more social than Type 1 people, valuing being with other people more highly. These users had low scores on traditional wilderness values, such as Privacy and Introspection and a low score on taking risks. Additionally, Type 2 was not as dependent on qualities of a wilderness area as Type 1.

Type 3 users were a primarily male, highly experienced group. Scenery was the only outcome that strongly added to Type 3 users' wilderness experiences. The generally low responses to the outcome clusters makes interpreation for this group difficult. Social contacts were not valued as highly as getting exercise, exploring, privacy, and learning about nature. A satisfying wilderness experience for this group would be particularly sensitive to scenery and less sensitive to

the other aspects of the wilderness environment (being alone, challenges, etc.).

Type 4 was younger than the other groups and comprised the largest proportion of users. Type 4 users valued outcomes similar to Type 3, but they valued these outcomes at a higher level. There was greater differentiation between what was important and what was unimportant for Type 4 users. Learning, exploring, escaping pressure, and autonomy were all important to Type 4 users. This group also valued taking risks more highly than any other group. Privacy and Introspection were not important to this group. However, given the active nature of Type 4 (exploring, exercise, risk, etc.) the more physically challenging aspects of wilderness were more important than the reverie (solitude) aspects.

Management for Maroon Bells-Snowmass Wilderness Users

The four types of MBSW users that have been defined require different management objectives. Managers cannot use just one management objective and expect to satisfy four different types of users.

Although Type 1 was a small group of users, their preference for privacy and introspection makes management for their desired experience more restrictive. The opportunity for solitude is part of the definition of a wilderness area. Because this requirement is not as important to the other types of users, different management objectives must be established for Type 1. Opportunities for being alone cannot be provided when there are also opportunities for meeting and being with other people. Part of the planning framework outlined by Brown, Driver

and McConnell (1978) was selecting experiences that were unique to the wilderness resource.

Type 2 users were probably borderline wilderness users. Type 2 users had preferences for a wilderness experience that were not necessarily dependent on the wilderness resource. The preference for scenery and family togetherness could be satisfied in areas outside the wilderness boundary. Information programs about backcountry areas could direct these people to other areas, where their preferences could be met. Backcountry areas are less restrictive in their use of informational signs and facilities. These reduce taking risks, which Type 2 rated low on the scale.

By managing for Type 4 users, managers can also satisfy Type 3 users. Types 4 and 3 value many of the same aspects of the wilderness, exercise-challenge, but value these outcomes at different levels. Management objectives for these users might include remote trailless areas, steep trails, and rock climbing areas. These features would enhance the exercise and challenge demanded by both types 3 and 4. This would also include managing for the majority of users.

Preferences for Setting Attributes

The results of the ratio scaling of attribute items indicate that social attributes were the most important to wilderness users and therefore should be managed for most intensely. However, this conclusion is not sufficient given the data.

If social attributes were actually the most important setting features, one would expect that negative social features would detract from a wilderness experience. The ratings of the negative items were mixed, but three physical items were in the top five - least desirable items. Two possible explanations for these responses are offered. The first explanation suggests that physical attributes are the most important features of the wilderness environment. The second explanation is based on the two-factor or hygiene theory (Herzburg in Steers and Porter, 1975) and suggests that social items are the most important.

Physical Attributes as the Most Important Wilderness Feature--Alternative One

Areas are chosen to be wilderness areas based on two primary criteria. The first is the outstanding physical features that are represented by an undisturbed natural environment. The second criterion is the opportunity for solitude, suggesting a large area with a low people/square mile ratio.

When people go to wilderness areas they expect to see an undisturbed environment. Results from this study suggest that when the pristine physical features are damaged or otherwise do not match expectations, they can greatly detract from a person's wilderness experience. The usual image of a wilderness area is a wild and untrammeled area. MBSW users indicated that scenery strongly added to their wilderness experience more so than any other reason for recreating in a wilderness environment. This is also supported in the response to a question on the mailback form.

A question aimed at validation of the attribute responses was included on the questionnaire. This asked respondents to select the attribute type, either physical, social, or managerial, that was most important to them in the wilderness environment. The response was overwhelmingly in favor of physical attributes.

There were several physical attributes from the preliminary questionnaire that were rated much higher (1.0 or more on a 9-point scale) than any of the physical attributes used on the mailback questionnaire. These attributes included clean air, cascading streams, and virgin forests, etc. These high-ranking physical attributes were not used because they had ratings far above any of the other items in the attribute groups. Had these physical attributes been included they may have ranked higher than the social attributes.

With outstanding physical attributes as a given, social attributes become features of the wilderness environment that are most important. Specifically, these highly rated social attributes concern a minimal number of contacts with other people. This can be interpreted in two ways. First, other people clutter up the environment and detract from the natural beauty. Another reason for desiring few people might be the opportunity for solitude. The MBSW data appear to support the former reason since only Type 1 respondents highly valued privacy and opportunities to be alone.

Physical attributes can be considered as the most important features of the wilderness environment. However, when people are asked to select between physical, social, and managerial attributes, physical attributes are taken for granted and then social attributes become the most important.

Social Attributes as the Most Important Wilderness Feature--Alternative Two

Another possible explanation for the results of rating the wilderness setting attributes is the two-factor or hygiene theory developed by Herzberg (outlined in Steers and Porter, 1975, and Lawler, 1973). The basic premise of this theory is that attributes that cause satisfaction and attributes that cause dissatisfaction are not opposites. That is, the absence of an attribute that usually causes satisfaction will not necessarily result in dissatisfaction and vice versa. This theory has been the subject of some controversy (Steers and Porter, 1975). However, it is offered here as an alternative explanation.

Using the two-factor theory, social attributes are the most important features of the wilderness environemnt for MBSW users. Specifically, the social attributes that concern avoidance of people are most important. Physically damaged features cause the most dissatisfaction in the wilderness environment and are to be avoided or prevented if possible.

The relationship between social attributes and physical items cannot really be assessed using the two-factor theory except in terms of what managers should avoid.

Conclusion

There seems to be more support for the suggestion that physical attributes of the wilderness environment are most important to MBSW users. Positive physical attributes are expected and a major reason for users coming to a wilderness area. Since pristine physical attributes are expected, social (people-avoiding) attributes are next in importance

for MBSW users. Therefore managerial items then become important when there are only moderate physical and social attributes to choose between.

The fact that the four MBSW user types did not significantly differ on their ratings of the three attribute types is not surprising given the sample population. Respondents were highly experienced wilderness users and experienced in the MBSW. Respondents knew what to expect in the MBSW and chose that area for its inherent features.

Implications for Management

The results of this study have several implications for wilderness planning and management and particularly for the Maroon Bells-Snowmass Wilderness.

Managers must be able to define the recreational opportunities available on their lands so that they will know what is being produced. Knowing what adds to users' recreation experiences enables the manager to plan for and provide those features that add to satisfaction (ORRRC, Report No. 6, 1962; Tocher, Wagar and Hunt, 1965; Wagar, 1966; Wennegren and Johnston, 1977). Recent legislation has required the inventory and assessment of all natural resources, recreation being one of those resources.

To facilitate this assessment and inventory, recreational experiences have been defined as the combination of four demands (Driver and Brown, 1977). Two of those demands, psychological outcomes and setting attributes, were the focus of this study. These demands for recreation experiences are separate and identifiable components. The psychological outcomes and setting attributes found in this research fit into the

general planning framework established earlier (Brown, Driver and McConnell, 1978).

Two major features of the recreational inputs into this model are quantities and qualities of the recreation experience. This research showed that a small percentage of users (Type 1) require specific management for solitude. Also, a different management strategy could satisfy a larger percentage of users (Types 3 and 4). One focus of wilderness recreation research is to identify those experiences that are most dependent on the wilderness resource (Hendee, 1974; Hendee and Burdge, 1974; and Stankey, 1974). Type 2 users were identified as being a group that was not dependent on the wilderness resource.

Quality was investigated in terms of what adds to and detracts from users' wilderness experiences and what attributes are most important or least desirable.

These desired outcomes and attributes are useful in the consumer analysis, demand analysis and prioritizing of demand stages of the planning model. The results of this study describe the preferences of the MBSW users, quantifies how much of each recreation experience is demanded, and then gives a basis for prioritizing these demands. There are four types of users with similar setting preferences. These groups vary in size, but the smallest group is most dependent on the wilderness resource and must be considered first.

The attribute preferences in this study can be used in inventorying an area in the capability step of the planning model by identifying the features, i.e., undisturbed physical features, to which the inventory should be sensitive. These can also be used in the suitability analysis.

The data collected here can be incorporated into the formation of management objectives. A management objective for Types 3 and 4, using the data, might emphasize providing the opportunity for exercise and risk taking. These might be provided in trailless areas, areas with steep trails, and areas with opportunities for rock climbing. A Type 1 management objective might emphasize the opportunity to experience solitude in the wilderness environment.

This study also gives support to the theories on which the models of recreation behavior are based. Using these models, specific components of the wilderness experience can be identified. Knowledge of people's attitudes (and the components of attitude) contribute to explanations of their behavior. By understanding the behavior of wilderness users, predictions of future demand ensue.

Ratio Scaling

The ratio scaling technique used in this study was exploratory and conclusions from this are to be considered speculative. Whether or not these results represent an actual ratio scale or whether people were just following directions is not clear. However, using this method in a pilot study such as this does suggest some improvements on the procedure.

First, an expanded list of atttributes on a pretest questionnaire should include more negative physical and managerial items. A pretest population should be sufficiently large to enable cluster analysis of the attribute items. This cluster analysis would aid in the grouping of attributes for the ratio scaling. Also, cluster analysis would help

differentiate between attribute types. Particularly, this analysis could help distinguish between social attributes and managerial attributes which are classified subjectively.

Secondly, experimenting with the constant sum method of ratio scaling is recommended. Using this method and comparing it to the fractionation method used here would contribute to the validation of the ratio scale. If the ratios between items, using the two methods, were similar, more confidence could be placed in this approach.

Additional refinements could include social and managerial attribute items that are as highly rated as the high physical items which would then allow for comparisons. Also, the use of more than six attribute items in a group might reveal some differences that were not perceived using the technique outlined in this study.

The use of logarithms is probably not necessary in the analysis of ratio scales. They were used because of their use in previous research. However, much of this previous work has dealt with subjective measurements versus come actual physical measurement. The use of logarithms is necessary to form a linear relationship between the two. In the ratio measurements used here, logarithms are unimportant since they do not directly relate to any physical measurement.

Tentatively, the following implications of this study are offered. The first is that setting attributes are not weighted the same when making judgements about what is important in a wilderness environment. People can distinguish between these attributes using a ratio scale system. This technique can be used to explore major-choice determinants of recreationists' behavior. Some items that rate very high using a

9 point interval scale are actually not as important when faced with making a decision about what is most important. For example, Boulder Fields rated similarly as Considerate People on an interval scale, but was only half as important as Considerate People on a ratio scale.

Therefore, ratio scaling should be pursued as a technique for measuring recreationists' preferences in the future.

LITERATURE CITED

Ajzen, Icek and Martin Fishbein. 1973. Attitudinal and normative variables as predictors of specific behavior. J. Pers. Soc. Psychol. 27(1):41-57.

Allport, Gordon W. 1968. The historical background of modern psychology. In The Handbook of Social Psychology. Gardner Lindzey and Elliot Sronson, eds., p. 1-80. Addison-Wesley, Reading, Mass.

American Forest Institute. 1977. Public participation in outdoor activities and attitudes toward wilderness. Research Recap 10:4.

Anderson, Norman H. 1974. Algebraic models in perception. In Handbook of Perception. Edward C. Carterette and Morton F. Friedman, eds., p. 215-291. Academic Press, New York.

_____. 1976. How functional measurement can yield validated interval scales of mental quantities. J. Appl. Psychol. 61(6): 677-692.

Atkinson, John W. 1958. Toward experimental analysis of human motivation in terms of motives, expectancies, and incentives. In Motives in Fantasy Action and Society. John W. Atkinson, ed., p. 873. Van Nostrand Reinhold, Princeton, N.J.

_____. 1964. An introduction to motivation. P. 335. Van Nostrand Reinhold, Princeton, N.J.

Baron, Robert A., Donn Byrne, and William Griffitt. 1974. Social psychology. P. 187-224. Allyn and Bacon, Boston.

Bass, Bernard, Wayne F. Cascio and Edward J. O'Connor. 1974. Magnitude estimates of expressions of frequency and amount. J. Appl. Psychol. 59(3):313-320.

Battle, Nancy. 1978. Elk hunting satisfactions. P. 123. Unpublished Master's Thesis. Colorado State University, Fort Collins, Colorado.

Belk, Russell W. 1975. Situational variable and consumer behavior. J. Cons. Res. 2(3):157-167.

Bem, Daryl J. 1970. Beliefs, attitudes and human affairs. 114p. Brooks/Cole, Monterey, Calif.

Brown, Perry J. 1975. Whitewater rivers: Social inputs and carrying capacity based decisions. In Managing Colorado River White Water: The Carrying Capacity Strategy. L. E. Royer, W. Becker, and R. Schreyer, eds., 1977, p. 92-121. Institute for the Study of Outdoor Recreation and Tourism, Utah State Univ., Logan, Utah.

_____. 1977. Information needs for river recreation planning and management. In River recreation management and research proceedings (Minneapolis, Minn., Jan. 1977). U.S. Dept. Agric. For. Serv., Gen. kech. Rep. NC-28, p. 193-201.

_____, A. Allen Dyer, and Ross S. Whaley. 1973. Recreation research--so what? J. Les. Res. 5(4):16-24.

_____, Beverly L. Driver and George H. Stankey. 1976. Human behavioral science and recreation management. In Sixteenth International Union of Forestry Research Organizations World Conference Proceedings, Vienna, Austra, June, 1976 6:53-63.

_____, Jacob E. Hautoluoma, and S. Morton McPhail. 1977. Colorado deer hunting experiences. Paper presented at 42nd North Am. Wildlife and Nat. Res. Conference, Atlanta, Ga. p. 216-225.

_____, B. L. Driver, and C. McConnell. 1978. The opportunity spectrum concept and behavioral information in outdoor recreation resource supply inventories: Background and application. In Integrated Inventories of Renewable Natural Resources Proceedings, Tucson, Ariz. Jan 8-12, 1978. U.S. Dept. Agric. For. Serv., Gen. Tech. Rep. RM-55. p. 73-84.

_____, and Glenn E. Haas. No date. Wilderness recreation experiences: The Rawah case. Xerox. Colorado State University, Fort Collins, Colorado.

Carroll, John B. 1971. Measurement properties of subjective magnitude estimates of word frequency. J. Verbal Learn. and Verbal Behav. 10:722-729.

Dawes, Robyn M. 1972. Fundamentals of attitude measurement. p. 165. John Wiley and Sons, New York.

Doob, L. W. 1947. The behavior of attitudes. Psychol. Rev. 54(3): 135-156.

Driver, B. L. 1972. Potential contributions of psychology to recreation resource management. In Environment and the Social Sciences: the Perspectives and Applications. Joachim F. Wohlwill and Daniel H. Carson, ed., p. 233-248. Amer. Psychol. Assoc., Wash., D.C.

_____. 1976a. Quantification of outdoor recreationists' preferences. In Research Camping and Environmental Education. Betty van der Smissen (comp.) p. 165-187. Penn. State Univ. HPER Series 11, State College, Penn.

_____. 1976b. Toward a better understanding of the social benefits of outdoor recreation participation. P. 163-189. In Proc. South

States Appl. Workshop, U.S. Dept. Agric. For. Serv. Gen. Tech. Rep. SE-9, Southeast For. Exp. Stn., Asheville, N.C.

_____, and Perry J. Brown. 1975. A social-psychological definition of recreation demand, with implications for recreation resources planning. In Assessing demand for outdoor recreation, p. 65-88. Natl. Academy of Sci. (Reprinted by the Bur. of Outdoor Rec.), Wash., D.C.

_____, and Perry J. Brown. 1978. The opportunity spectrum concept and behavioral information in outdoor recreation resource supply inventories: A rationale. In Integrated inventories of renewable natural resources proceedings, Tucson, Ariz., Jan. 8-12, 1978. U.S. Dept. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 24-31.

_____, and Richard C. Knopf. 1975. Some thoughts on the quality of outdoor recreation research and other constraints on its application. P. 22. Xerox. Paper presented at Workshop for Outdoor Rec. Researchers and Cooperators (Mar. 10, 1975), Land Between the Lakes, Tenn.

_____, and Ray W. Cooksey. (in press) Types of psychological outcomes desired from fishing. In Proc. Natl. Sport Fishing Symp., Humboldt State University, Arcata, Calif.

Dulaney, D. E. 1968. Awareness, rules, and propositional control: A confrontation with S-R behavior theory. In Verbal Behavior and S-R Behavior Theory. D. Horton and T. Dixon, eds., p. 340-387. Prentice Holt, Englewood Cliffs, N.J.

Edwards, Ward. 1954. The theory of decision making. Psychol. Bull. 51(4):380-417.

Festinger, Leon. 1957. A theory of cognitive dissonance. P. 291. Row, Peterson, Evanston, Ill.

Fishbein, Martin, and Icek Ajzen. 1975. Beliefs, attitude, intention, and behavior: An introduction to theory and research. P. 578. Addition-Wesley, Reading, Mass.

Foster, John D. 1976. Bureau of Land Management primitive areas--Are they counterfeit wilderness? Nat. Res. J. 16(3):621-663.

Frissell, Sidney S., Jr., and George H. Stankey. 1972. Wilderness environmental quality: Search for social and ecological harmony. In Soc. Am. For. Proc., Hot Springs, Ark. p. 170-183.

Galbraith, Jay, and L. L. Cummings. 1967. An empirical investigation of the motivational determinants of task performance: Interactive effects between instrumentality, valence and motivation ability. Org. Behav. Human Perform. 2:237-257.

Garner, W. R. 1954. Techniques and a scale for loudness measurement. Acous. Soc. Am. J. 26:73-88.

Guilford, J. P. 1954. Psychometric methods. 2d ed. p. 208-260. McGraw-Hill, New York.

Haas, Glenn E., Deborah J. Allen, and Michael J. Manfredo. (in press) Some dispersed recreation experiences and the resource settings in which they occur. Paper presented at 9th Ann. Environ. Design and Res. Assoc. Conference (April 1978), Tucson, Ariz.

Haas, G. E., and G. W. Plisco. 1979. A co-op management-research demonstration project. Paper presented at First Am. Nat. Conf. on Rec. Planning and Dev. April 18-21, Snowbird, Utah. Forthcoming in the proc. published by Am. Soc. of Civil Engineers.

Hammond, K. R., R. R. Stewart, B. Brehmer, D. O. Steinman. 1975. Social judgement theory. In Human judgement and decision processes. Martin E. Kaplan and Steven Schwartz (eds.). P. 271-312. Academic Press, New York.

Hansen, Fleming. 1976. Psychological theories of consumer choice. J. Consumer Res. 3(3):117-142.

Harris, Charles C. 1978. Crowding in a wilderness setting: The influence of social interaction on user satisfaction. P. 116. Unpub. Masters Thesis. Colo. State Univ., Fort Collins, Colo.

Hautoluoma, Jacob E., and Perry J. Brown. 1978. Attributes of the deer hunting experience: A cluster analytic study. J. Les. Res. 10(4):271-287.

Hvighurst, Robert J. 1957. The leisure activities of the middle-aged. Amer. J. Soc. 63:152-162.

Heider, Fritz. 1958. The psychology of interpersonal relations. P. 322. Wiley, New York.

Hendee, John C. 1974. A multiple-satisfaction approach to game management. Wildlife Soc. Bull. 2(3):104-113.

_____, and Dale R. Potter. 1971. Human behavior and wildlife management: Needed research. Transact, 36th N. Am. Wildlife and Nat. Res. Conf. P. 383-396. Wildlife Mgt. Institute, Wash., D.C.

_____, and Rabel Burdge. 1974. The substitutability concept: Implications for recreation research and management. J. Les. Res. 6(2):157-162.

Jones, F. Nowell. 1974. Overview of psychological scaling methods. In Handbook of perception. Edward C. Carterette and Morton F. Friedman, eds., p. 343-360. Academic Press, New York.

King, David A., and Merton T. Richards. 1977. Determinants of choice in outdoor recreation. In Outdoor recreation: Advances in application of economics. Jay M. Hughes and R. Duane Lloyd (eds.). U.S. Dept. Agric. For. Serv. Gen. Tech. Rep. WO-2:91-97.

Knopp, Timothy B. 1972. Environmental determinants of recreation behavior. J. Les. Res. 4(2):129-138.

Lawler, Edward E. 1971. Pay and organizational effectiveness: A psychological review. P. 318. McGraw-Hill. New York.

_____. 1973. Motivation in work organizations. p. 224. Brooks/Cole, Monterey, Calif.

_____, and Lyman Porter. 1967. Antecedent attitudes of effective managerial performance. Org. Behav. Human Perform. 2:122-142.

Lewin, Kurt. 1938. A dynamic theory of personality. 1st ed. p. 286. McGraw-Hill, New York.

Liebert, Robert M., and Michael D. Spregler. 1970. Personality: An introduction to theory and research. P. 214-242. The Dorsey Press, Homewood, Ill.

Lime, David W. 1970. Research for determining use capacities of the Boundary Water Canoe Area. Naturalist 21(4):9-13.

_____. 1974. Principles of recreational carrying capacity. In Proc. South. States Rec. Research Applications Workshop. U.S. Dept. Agric. For. Serv. Gen. Tech. Rep. SE-9. Southeast For. Exp. Sta., Asheville, N.C.

_____. 1977. Research for river recreation planning and management. In River recreation management and research proceedings (Minneapolis, Minn.-Jan. 1977). U.S. Dept. Agric. For. Serv. Gen. Tech. Rep. NC-28. p. 202-209.

_____, and George H. Stankey. 1971. Carrying capacity: Maintaining outdoor recreation quality. In Recreation Symposium Proc., October 12-14, Syracuse, New York. Northeast For. Exp. Sta. p. 174-184.

Litwin, George H., and Robert A. Stringer. 1968. Motivation and organizational climate. P. 214. Graduate School of Business, Harvard University, Boston, Mass.

Locke, Edwin A. 1975. Personnel attitudes and motivation. Ann. Rev. Psych. 26:457-480.

_____, J. F. Bryan, and L. M. Kendall. 1968. Goals and intentions as mediators of the effects of monetary incentives on behavior. J. Applied Psych. 52:104-121.

Lucas, Robert C. 1964. Wilderness perception and use--the example of the Boundary Waters Canoe Area. Natural Res. J. 3:394-411.

McPhail, S. Morton. 1978. Differentiation of two components of work expectancies. P. 319. Unpublished doctoral dissertation. Colorado State University, Fort Collins, Colo.

Manfredo, Michael J., Perry J. Brown, Glenn E. Haas. (In press) Fisherman values in wilderness. In Proc. Western Assoc. of Fish and Wildlife Agencies Workshop. Calif. Dept. Game and Fish, Sacramento, Calif.

Mercer, David. 1971. The role of perception in the recreation experience: A review and discussion. J. Les. Res. 3(4):261-276.

_____. 1973. The concept of recreational need. J. Les. Res. 5(1): 37-50.

More, Thomas. 1973. Attitudes of Massachusetts hunters. Proc. Thirty-eighth N. Am. Wildlife Nat. Res. Conf. Reprinted In Human Dimensions in Wildlife Programs. John Hendee and Clay Schoenfeld, eds., p. 72-126. Wildlife Management Institute, Wash., D.C.

Mueller, Eva, and Gerald Guin. 1962. Participation in outdoor recreation: Factors affecting demand among American adults. Outdoor Recreation Resources Review Commission Report No. 20, Department of Resources Development, Michigan State University. U.S. Gov. Printing Office, Wash., D.C.

Nie, Norman H., C. Hadlia Hull, Jiem, G. Jenkins, Karin Steinbrenner, and Dale H. Bent. 1975. Statistical Package for the Social Sciences. 2nd ed. p. 675. McGraw-Hill, New York.

Nunnally, Jum C. 1967. Psychometric theory. P. 640. McGraw-Hill, New York.

Outdoor Recreation Resources Review Commission. 1962. Quality of outdoor recreation as evidenced by user satisfaction. Report No. 5. U.S. Gov. Printing Office, Wash., D.C.

Peterson, George. 1974. Evaluating the quality of the wilderness environment: Congruence between perception and aspiration. Environ. and Beh. 6(2):16-193.

Revelle, William. 1977. ICLUST: A program for analyzing the internal structure of tests. P. 23. Reprint, Dept. of Psych., Northwestern Univ., Evanston, Ill.

Schafer, Elwood L., Jr. 1969. The average camper who doesn't exist. p. 27. N.E. Forest Exp. Sta., Upper Darby, Pa.

Sheth, J. N., and P. S. Rajo. 1974. Sequential and cyclical nature of information processing models in repetitive choice behavior. Advances in Consumer Behavior 1:348-358.

Sieker, John. 1951. The future of forest recreation. J. For. 49(7): 503-506.

Simon, H. A. 1957. Administrative behavior. 2nd ed. MacMillan, New York.

Slovic, Paul, Baruch Fischhoff and Sarah Lichtnestein. 1977. Behavioral decision theory. Ann. Rev. Psych. 28:1-39.

Stankey, George H. 1971. Wilderness carrying capacity and quality. Naturalist 22(3):7-13.

_____. 1974. Criteria for the determination of recreational carrying capacity in the Colorado River Basin. In Environmental Management in the Colorado River Basin. A. B. Crawford and D. F. Peterson, eds., p. 82-89. Utah State University, Logan, Utah.

Steers, Richard M., and Lyman W. Porter. 1975. Motivation and work behavior. P. 575. McGraw-Hill Book Co., N.Y.

Stevens, S. S. 1951. Mathematics, measurement, and psychophysics. In Handbook of Experimental Psychology. S. S. Stevens, ed., p. 1-49. John Wiley, New York.

_____. 1962. The surprising simplicity of sensory metrics. Amer. Psych. 17(1):29-39.

_____. 1966. A metric for the social censensus. Science 19:530-541.

_____. 1974. Perceptual magnitudes and its measurement. In Handbook of Perception. Edward Carterette and Morton Friedman, eds., p. 361-391. Academic Press, New York.

Thurstone, L. L. 1945. Factor analysis of body types. Psychometrika 11:15-21.

Tocher, S. Ross, J. Alan Wagar, and John D. Hunt. 1965. Sound management prevents worn-out recreation sites. Reprint. P. 4. Parks and Recreation, March.

Tolman, Edward C. 1932. Purposive behavior in animals and men. P. 463. The Century Co., New York.

United States Department of Agriculture. 1968. Annual report of the Chief of the Forest Service. P. 14. U.S. Gov. Printing Office, Wash., D.C.

_____. 1975. The nation's renewable resources--An assessment. P. 345. U.S. Gov. Printing Office, Wash., D.C.

_____. 1978. Annual report of the Chief of the Forest Service. P. 28. U.S. Gov. Printing Office, Wash., D.C.

Vroom, Victor H. 1964. Work and motivation. P. 331. John Wiley, New York.

Wagar, J. Alan. 1964. The carrying capacity of wildlands for recreation. Forest Service Monograph 7. P. 24. Soc. Am. For.

_____. 1966. Quality in outdoor recreation. Trends 3(3):9-12.

_____. 1974. Recreational carrying capacity reconsidered. J. For. 72(5):274-278.

Wagar, J. V. K. 1951. Some major principles in recreation land use planning. J. For. 49(6):431-435.

Wennegren, E. Boyd, and Warren E. Johnston. 1977. Economic concepts relevant to the study of outdoor recreation. In Advances in Application of Economics. U.S. Dept. Agric. For. Ser. Gen. Tech. Rep. WO-2.

Wolfe, John H. 1971. NORMIX--360 computer program. Research memo. p. 7. SRM 72-4, Naval Personnel and Training Research Lab., San Diego, Calif.

Woodside, Arch G., and James D. Clokey. 1974. Multiattribute/multibrand models. J. Adv. Res. 14(5):33-40.

APPENDICES

APPENDIX A

FRONT-END INTERVIEW SCHEDULE

MSBW (SUMMER-FALL, 78)

CARD 1

(1-2) STATION _____ ID 1A _____ (75-80)

(3-6) DATE _____ INTERVIEWER _____

(7) TIME OF WEEK: WEEKDAY (1) WEEKEND (2) HOLIDAY (3) (8-9) HOUR _____

* * * \

CARD 4

(1-2) WHICH ACTIVITY WAS MOST IMPORTANT TO YOU AS A REASON FOR VISITING THE AREA? (Above #) ________

(3-4) PREVIOUS VISITS TO THE AREA WITHIN THE PAST 12 MONTHS? #________ (5) IF ZERO, HAVE YOU EVER BEEN HERE BEFORE? YES (1) NO (2)

(6) GROUP COMPOSITION: FAMILY (1) FRIENDS (2) FAMILY & FRIENDS (3) ORGANIZED GROUP (4) ALONE (5)

(7-8) # OF PEOPLE IN YOUR PARTY: #________

MODE OF REC TRAVEL: (check if yes)

CAR (9)______ MOTORCYCLE (11)______ HIKE (13)______ HIKE WITH PACK ANIMAL (15)______

4-WHEEL (10)______ OTHER VEHICLE (12)______ HORSE (14)______ OTHER MODE (specify) (16)______

ADDRESS OF PERMANENT RESIDENCE: PERSON 1

CARD 5 NAME ______________________________ (2-35) ID 5A___ (75-80)

CARD 6 ADDRESS ______________________________ (2-35) ID 6A___ (75-80)

CARD 7 CITY, STATE ____________________ (2-30) ZIP__________ (31-35) ID 7A___ (75-80)

PERSON 2

CARD 8 NAME ______________________________ (2-35) ID 8A___ (75-80)

CARD 9 ADDRESS ______________________________ (2-35) ID 9A___ (75-80)

CARD 10 CITY, STATE ____________________ (2-30) ZIP__________ (31-35) ID 10A___ (74-80)

* *

CARD 4 - CONT.

(17-18) NUMBER OF NIGHTS: #______ (19-20) NUMBER OF OVERNIGHT SITES: #______

(21) DID INTERVIEWEE ENTER WILDERNESS: YES (1) NO (2)

(22) # OF PEOPLE IN VEHICLE: #______ (23) HAD TRAILER: YES (1) NO (2)

AGES

-15		16-20		21-35		36-55		+55		# PARTIES PASSED
M	F	M	F	M	F	M	F	M	F	
(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34-35)

OF ADDRESSES: #______ (36)

ID 4A______ (75-80)

APPENDIX B

PRELIMINARY QUESTIONNAIRE

COLORADO STATE UNIVERSITY

WILDERNESS USER PREFERENCE SURVEY - 1979

This questionnaire is designed to find out what aspects of the wilderness environment are attractive to wilderness users.

A personally satisfying trip into a wilderness area means different things to different people. Below is a list of features frequently found in wilderness areas. If you were to return to the wilderness area you visited most recently (name of wilderness area _____) please indicate how each feature listed below would add to or detract from your satisfaction from a wilderness experience.

If a particular feature was absent from the wilderness area you most recently visited, indicate this in the NOT APPLICABLE (9) column.

Features of Wilderness Environment	EFFECT ON SATISFACTION: Adds to: Very Strongly	Strongly	Moderately	Slightly	Neutral	Detracts from: Slightly	Moderately	Strongly	Very Strongly	Not Applicable	
1) Small mammals (pica, ground squirrel, etc.)	+4	+3	+2	+1	0	-1	-2	-3	-4	9	C1:(2-3)
2) Camping within sight and hearing range of another party	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
3) Few signs in the wilderness	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
4) Well maintained trails free of obstacles	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
5) Brightly colored equipment	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(10-11)
6) Fresh, clean air	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
7) Shortcut trails between switchbacks	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
8) Rock slides	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
9) Camping within sight and hearing range of three or more parties	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
10) Unpredictable weather	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(20-21)
11) Cutthroat trout	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
12) Gently rolling topography	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
13) Evidences of domestic livestock (droppings, grazed over, etc.)	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
14) Fire rings at campsites	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
15) Steep trails	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(30-31)
16) Meeting three or more hiking parties during the day	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
17) Presence of beaver	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
18) Virgin forests	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
19) Deeply eroded trails	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
20) Trail signs with destination mileages	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(40-41)

Features of Wilderness Environment	EFFECT ON SATISFACTION: Adds to — Most Strongly	Strongly	Moderately	Slightly	Neutral	Detracts from — Slightly	Moderately	Strongly	Most Strongly	Not Applicable	
21) Considerate, respectful people	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
22) Litter along the trail	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
23) Presence of mule deer	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
24) Areas above timberline	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
25) Good fishing streams	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(50-51)
26) Man-made structures (bridges, cabins, etc.)	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
27) Dead vegetation around campsites	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
28) Briefly chatting with others at your campsite	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
29) Hearing machinery-engines	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
30) Long strings of pack animals	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(60-61)
31) Long conversations with others on the trail	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
32) Pets on leashes	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
33) Bridges placed at dangerous stream crossings	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
34) Directional signs along trails	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
35) Uniformed wilderness rangers	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(70-71)
36) Rainbow trout	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(72-73)
37) Barren, rocky peaks	+4	+3	+2	+1	0	-1	-2	-3	-4	9	C2:(1-2)
38) Loud, boisterous people	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
39) Someone walking through your campsite	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
40) Panoramic (wide-angle) vistas	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
41) Camping near good technical climbing areas	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
42) Lakes with no trails to them	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
43) Rugged terrain	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
44) Camping with no one in sight or hearing range	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
45) Evidence of glacial activity	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(17-18)
46) Slow moving streams with deep holes	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
47) Accurate maps of campsites	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
48) Pack animals that have wandered	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
49) Soil erosion around campsite	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
50) Briefly chatting with others on the trail	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(27-28)
51) Boulder fields	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
52) Seeing domestic livestock	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
53) Poor sanitation disposal near campsites	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
54) Campsites that are close together	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
55) Not meeting any other groups during the day	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(37-38)

	Features of Wilderness Environment	EFFECT ON SATISFACTION: Adds to: Most Strongly	Strongly	Moderately	Slightly	Neutral	Detracts from: Slightly	Moderately	Strongly	Most Strongly	Not Applicable	
56)	Coyotes	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
57)	Snowfields	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
58)	Evidences of forest fires	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
59)	Litter at campsites	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
60)	Seeing stripped or damaged trees	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(47-48)
61)	Pets running loose	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
62)	Footbridges over boggy areas	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
63)	Cascading streams	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
64)	Dense, thick undergrowth	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
65)	Variety of buds	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(57-58)
66)	Camping within sight of 1-2 parties which are out of hearing range	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
67)	Bighorn sheep	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
68)	Seeing no one else, except the members of your party, for 2-3 days	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
69)	Wildflowers in bloom	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
70)	Meeting a party of six or more on horseback during the day	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(67-68)
71)	Natural lakes and ponds	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
72)	Long conversations with others at your campsite	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
73)	Knowing the regulations that govern an area	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(73-74)
74)	Naturally producing native fish	+4	+3	+2	+1	0	-1	-2	-3	-4	9	C2:(1-2)
75)	Waterfalls	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
76)	Aspen groves	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(5-6)
77)	Camping where 3 other parties are within hearing range	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
78)	Beaver ponds	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
79)	Evergreen forests	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
80)	Presence of elk	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(13-14)
81)	Knowing where the crowded areas of the wilderness are	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(15-16)
82)	Clean, drinkable water	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
83)	Unusually shaped rocks	+4	+3	+2	+1	0	-1	-2	-3	-4	9	
84)	Presence of domestic livestock	+4	+3	+2	+1	0	-1	-2	-3	-4	9	(21-22)

People with different characteristics have different preferences. So that we can better understand your responses, we would appreciate your answering the following, more personal questions.

1. How many trips have you made to wilderness areas in the past two years (since June 1, 1976)? C3:(31)

0, this is my first visit	1	2-3	4-5	6-7	8-9	10 or more

2. How many people went with you on your most recent trip into a wilderness area? (32)

Alone	1	2-3	4-5	6-7	8-9	10 or more

3. Sex (1)_____Male (2)_____Female (33)

4. Your age at your last birthday: _____ yr. (34)

5. What is the highest level of education you have completed (circle one)? (35-36)

Elementary	1	2	3	4	5	6	7	8
High School or Vocational School	9	10	11	12				
College of Technical School	13	14	15	16				
Post-Graduate	17	18	19	20	21	22		

6. Population of community where you now live? (37)

(1)_____100,000 or more (3)_____5,000 - 24,999 (5)_____Farm

(2)_____25,000 - 99,000 (4)_____below 5,000

APPENDIX C
MAILBACK QUESTIONNAIRE

Colorado State University
Maroon Bells-Snowmass Wilderness
User Questionnaire-1979

This questionnaire has been designed to learn more about the preferences of the users of the Maroon Bells-Snowmass Wilderness. Please answer the following questions and return the questionnaire in the postage-paid envelope provided.

I. 1. How many different designated wilderness/primitive areas have you visited in your lifetime? Total #_____(1-2)

2. Please estimate the total number of trips you have taken into designated wilderness/primitive areas? Total #_____(3-4)

3. How many visits have you made to the Maroon Bells-Snowmass Wilderness? Total #_____(5-6)

4. How many people (including yourself) went with you on your most recent trip into the Maroon Bells-Snowmass Wilderness? Total #_____(7-8)

5. How would you compare last summer's wilderness experience in the Maroon Bells-Snowmass Wilderness to the wilderness experience you expected to have? "Last summer's wilderness experience was _____ than I expected." (Check one answer from below.)

A great deal worse	Much worse	Moderately worse	Slightly worse	About equal to what I expected		
					Slightly better	Moderately better	Much better	A great deal better

(9)

6. How would you compare last summer's wilderness experience in the Maroon Bells-Snowmass Wilderness to what you think an ideal wilderness experience should be? "Last summer's wilderness experience was _____ compared to my ideal wilderness experience."
(check one space below)

Disappointing ——————————→ Equal to ideal (10)

II. Below are lists of features and situations found in the Maroon Bells-Snowmass Wilderness. For each group, assign 100 points to the feature or situation that is most important to you in the wilderness environment. Then assign points to the other items in the group based on how important that item is in comparison to the item you assigned the 100 points. For example, if you think an item is only half as important as the 100 point item, give the other item a rating of 50. Use any numbers you feel are appropriate, but always assign the most important item in a group 100 points. An example is shown below.

Example

	90	Wildflowers in bloom
Most Important →	100	Camping near good technical climbing areas
	60	Not seeing any litter
	80	Natural lakes and ponds
	50	Directional signs along the trail
	25	Not meeting any horse parties

Group 1.

_____ (12-14) Slow moving streams with deep holes

_____ (15-17) Camping with no one in sight or hearing range

_____ (18-20) Knowing where the crowded areas of the wilderness are

_____ (21-23) Bighorn sheep

_____ (24-26) Seeing no one else, except the members of your group for 2-3 days

_____ (27-29) Lakes with no trails to them

Group 2.

_____ (30-32) Not meeting any other groups during the day

_____ (33-35) Knowing the regulations that govern an area

_____ (36-38) The presence of beaver

_____ (39-41) Considerate people

_____ (42-44) Accurate maps of campsites

_____ (45-47) Boulder fields

Group 3.

_____ (49-51) Few signs in the wilderness

_____ (52-54) Unpredictable weather

_____ (55-57) Briefly chatting with others at your campsite

_____ (58-60) Bridges placed over dangerous stream crossings

_____ (61-63) Gently rolling topography

_____ (64-66) Briefly chatting with others along the trail

Group 4.

C2

_____ (1-3) Rock slides

_____ (4-6) Long conversations with other at your campsite

_____ (7-9) Well-maintained trails free of obstacles

_____ (10-12) Evidences of forest fires

_____ (13-15) Camping within sight of 1-2 parties which are out of hearing range

_____ (16-18) Trail signs with destination mileages

III. There are also features and situations in the wilderness environment that have negative effects. Below are two groups of items that might detract from your wilderness experience. Give 100 points to the item in each group that is the least desirable (or worst). Then assign points to the other items in the group in comparison to the least desirable (100 pts.) item. For example, an item that is only half as bad as the 100 point item would receive a rating of 50.

Group 1.

_____ (20-22) Pets on leashes

_____ (23-25) Firerings at campsites

_____ (26-28) Dead vegetation around campsites

_____ (29-31) Meeting a party of six or more on horseback during the day

_____ (32-34) Seeing domestic livestock

_____ (35-37) Shortcut trails between switchbacks

Group 2.

_____ (39-41) Long strings of pack animals

_____ (42-44) Deeply eroded trails

_____ (45-47) Brightly colored equipment

_____ (48-50) Campsites that are close together

_____ (51-53) Seeing stripped or damaged trees

_____ (54-56) Someone walking through your campsite

IV. A wilderness experience is affected by many factors, some of which are satisfying and some which are not. Assume that you were going to visit the Maroon Bells-Snowmass Wilderness next summer. How much would each of the following factors either add to (9) or detract from (1) your wilderness experience in the Maroon Bells Snowmass Wilderness. Circle one number for each factor.

	EFFECT ON A FUTURE WILDERNESS EXPERIENCE IN MBSW									
	ADD TO					DETRACT FROM				
	Most Strongly	Strongly	Moderately	Slightly	Neither Add Nor Detract	Slightly	Moderately	Strongly	Most Strongly	
1. Being away from civilization for awhile	9	8	7	6	5	4	3	2	1	
2. Being out-of-doors	9	8	7	6	5	4	3	2	1	
3. Avoiding the unexpected	9	8	7	6	5	4	3	2	1	(58)
4. Viewing the scenic beauty	9	8	7	6	5	4	3	2	1	
5. Sharing what you have learned with others	9	8	7	6	5	4	3	2	1	(60)
6. Talking to new and varied people	9	8	7	6	5	4	3	2	1	(61)
7. Testing your abilities	9	8	7	6	5	4	3	2	1	
8. Giving your mind a rest	9	8	7	6	5	4	3	2	1	
9. Helping direct the activities of others	9	8	7	6	5	4	3	2	1	
10. Feeling isolated	9	8	7	6	5	4	3	2	1	(65)
11. Thinking about who you are	9	8	7	6	5	4	3	2	1	
12. Learning more about nature	9	8	7	6	5	4	3	2	1	
13. Thinking about good times you have had in the past	9	8	7	6	5	4	3	2	1	
14. Being near others who could help you if you need them	9	8	7	6	5	4	3	2	1	
15. Showing others you can do it	9	8	7	6	5	4	3	2	1	(70) 02 (73)=2 77-80=ID

	EFFECT ON A FUTURE WILDERNESS EXPERIENCE IN MBSW									
	ADD TO					DETRACT FROM				
	Most Strongly	Strongly	Moderately	Slightly	Neither Add Nor Detract	Slightly	Moderately	Strongly	Most Strongly	
16. Being with friends	9	8	7	6	5	4	3	2	1	C3(1)
17. Getting to know the lay of the land	9	8	7	6	5	4	3	2	1	
18. Doing something with your family	9	8	7	6	5	4	3	2	1	
19. Being on your own	9	8	7	6	5	4	3	2	1	
20. Observing other people in the area	9	8	7	6	5	4	3	2	1	(5)
21. Being near considerate people	9	8	7	6	5	4	3	2	1	
22. Learning what you are capable of	9	8	7	6	5	4	3	2	1	
23. Being free to make your own choices	9	8	7	6	5	4	3	2	1	
24. Being away from noise back home	9	8	7	6	5	4	3	2	1	
25. Getting away from the usual demands of life	9	8	7	6	5	4	3	2	1	(10)
26. Knowing others who could help you are nearby	9	8	7	6	5	4	3	2	1	
27. Developing your skills and abilities	9	8	7	6	5	4	3	2	1	
28. Resting physically	9	8	7	6	5	4	3	2	1	
29. Developing your skills and abilities	9	8	7	6	5	4	3	2	1	
30. Being with others who enjoy the same thing you do	9	8	7	6	5	4	3	2	1	(15)
31. Keeping physically fit	9	8	7	6	5	4	3	2	1	
32. Studying nature	9	8	7	6	5	4	3	2	1	
33. Taking risks	9	8	7	6	5	4	3	2	1	
34. Being close to nature	9	8	7	6	5	4	3	2	1	
35. Experiencing excitement	9	8	7	6	5	4	3	2	1	(20)
36. Testing and using your equipment	9	8	7	6	5	4	3	2	1	
37. Releasing or reducing some built-up tensions	9	8	7	6	5	4	3	2	1	
38. Being your own boss	9	8	7	6	5	4	3	2	1	
39. Experiencing new and different things	9	8	7	6	5	4	3	2	1	
40. Becoming better at it	9	8	7	6	5	4	3	2	1	(25)
41. Experiencing more elbow room	9	8	7	6	5	4	3	2	1	
42. Getting exercise	9	8	7	6	5	4	3	2	1	
43. Bringing your family closer together	9	8	7	6	5	4	3	2	1	
44. Being with other members of your group	9	8	7	6	5	4	3	2	1	
45. Teaching your outdoor skills to others	9	8	7	6	5	4	3	2	1	(30)
46. Viewing the scenery	9	8	7	6	5	4	3	2	1	
47. Feeling your independence	9	8	7	6	5	4	3	2	1	
48. Chancing dangerous situations	9	8	7	6	5	4	3	2	1	
49. Experiencing tranquility	9	8	7	6	5	4	3	2	1	
50. Gaining a sense of self-confidence	9	8	7	6	5	4	3	2	1	(35)
51. Having a change from your daily routine	9	8	7	6	5	4	3	2	1	
52. Enjoying the sounds and smells of nature	9	8	7	6	5	4	3	2	1	
53. Thinking about your personal values	9	8	7	6	5	4	3	2	1	
54. Learning more about things here	9	8	7	6	5	4	3	2	1	(39)

V. Features of the wilderness environment can be divided into three types; physical features (trees, water, meadows, etc.), social features (the number of people you meet, the kind of people you meet, etc.), and managerial features (rules and regulations, facilities, services, etc.).

Which of the three types of features is most important to you in the Maroon Bells-Snowmass Wilderness environment? Circle one.

1. Physical features 2. Social features 3. Managerial features (41)

VI. People with different characteristics have different preferences, therefore we would appreciate your answering the following, more personal questions. All information will be kept confidential.

1. Your age at your last birthday: _____yr. (43-44)

2. Sex (1)____Male (2)____Female (45)

3. Marital status (1)____Single (2)____Married (46)

4. What is the highest level of education that you have completed? Please circle one.

Grade School	1	2	3	4	5	6	7	8
High School	9	10	11	12				
College or Technical School	13	14	15	16				
Post Graduate	17	18	19	20	21	22		

(47-48)

5. Population of community where you now live?

(1)____100,000 or more (3)____24,999 to 5,000 (5)____Farm (49)

(2)____99,999 to 25,000 (4)____below 5,000

6. Please enter the zip code of your home address: __ __ __ __ __ (50-54)

C3 (73)=3
(77-80)=ID

THANK YOU FOR YOUR HELP!

CSU Project 2211_____

Any questions? Contact -

Deborah J. Allen
Research Associate
Department of Recreation Resources
Colorado State University
Fort Collins, Colorado 80523
(303)-491-7218

APPENDIX D

PSYCHOLOGICAL OUTCOME ITEMS GROUPED BY SCALES AND DOMAINS[1]

Domain A: Achievement

1. Reinforcing Self Image [2]
   (I) *a. Gaining a sense of self-confidence.
   (I) b. Developing a sense of self-price.
2. Social recognition
   (I) a. Having others think highly of you for doing it.
   (I) *b. Showing others you can do it.
3. Skill development
   (I) a. Becoming better at it.
   (I) *b. Developing your skills and abilities.
4. Competence testing
   a. Testing your abilities
   b. Learning what you are capable of.
5. Seeking Stimulation
   (I) a. Having thrills.
   *b. Experiencing excitement

Domain B: Leadership/Autonomy

1. Independence
   (I) a. Feeling your independence.
   (I) *b. Being on your own.
2. Autonomy
   *a. Being your own boss
   b. Being free to make your own choices.
3. Control Power
   (I) a. Controlling things.
   (I) *b. Being in control of things that happen.
4. Teaching-Sharing Skills
   a. Teaching your outdoor skills to others.
   (I) *b. Sharing what you have learned with others.
5. Leading Others
   (I) *a. Helping direct the activities of others.
   (I) b. Leading other people.

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[1] Two item Scales for Driver's and Brown's Psychological Outcomes of Recreation Participation Scales. The attached scales and items were formed as a result of (1) data analysis of three sets of questionnaires sent to recreationists during the summer of 1978, (2) past research conducted by Driver and Brown, and (3) theoretical consideration of the scales and items.

[2] An (I) designates the item is a long-term core item from Driver's scale development work.

* = item to use in one item scales.

APPENDIX D (cont.)

Domain C: Risk Taking

1. Risk Taking
   a. Taking risks.
   (I) *b. Chancing dangerous situations.
2. Risk Moderation
   *a. Being near others who could help you if you need them.
   b. Knowing others are nearby.
3. Risk Avoidance
   a. Being sure of what will happen to you.
   *b. Avoiding the unexpected.

Domain D: Equipment

1. Equipment
   (I) a. Using your equipment.
   (I) b. Talking to others about your equipment.
   *c. Testing and using your equipment.

Domain E: Family Togetherness

1. Family Togetherness
   (I) *a. Doing something with your family.
   (I) b. Bringing your family closer together.

Domain F: Being with People

1. Being with Friends
   (I) a. Being with other members of your group
   *b. Being with friends.
2. Being with Similar People
   (I) *a. Being with others who enjoy the same things you do.
   (I) b. Being with people having similar values.

Domain G: Meeting-Observing New People

1. Meeting New People
   (I) *a. Talking to new and varied people.
   b. Meeting other people in the area.
2. Observing Other People
   (I) a. Being with and observing other people using the area.
   (I) *b. Observing other people in the area.

APPENDIX D (cont.)

Domain H: General Learning

1. General Learning
   (I) a. Developing your knowledge of things there.
   (I) *b. Learning more about things there.
2. Exploration
   (I) *a. Experiencing new and different things.
   b. Discovering something new.
3. Geography of Area
   *a. Getting to know the lay of the land.
   b. Learning about the topography of the land.
4. Learn about Nature
   (I) a. Studying nature.
   (I) *b. Learning more about nature.

Domain I: Relationships with Nature

1. Scenery
   (I) *a. Viewing the scenery.
   (I) b. Viewing the scenic beauty.
2. General Nature Experience
   (I) *a. Being close to nature.
   (I) b. Enjoying the sounds and smells of nature.

Domain J: Reflect on Personal Values

1. Spiritual
   (I) *a. Developing personal spiritual values.
   (I) b. Growing and developing spiritually.
2. Introspection
   (I) *a. Thinking about your personal values.
   (I) b. Thinking about who you are.

Domain K: Creativity

1. Creativity
   (I) a. Being creative.
   (I) *b. Doing something creative, such as sketching, painting, photography, etc.

Domain L: Nostaltia

1. Nostalgia
   (I) *a. Thinking about good times you've had in the past.
   (I) b. Bringing back pleasant memories.

APPENDIX D (cont.)

Domain M: Exercise/Physical Fitness

1. Exercise/Physical Fitness
   (I) a. Getting exercise.
   (I) *b. Keeping physically fit.

Domain N: Physical Rest

1. Physical Rest
   (I) a. Relaxing physically.
   (I) *b. Resting physically.

Domain O: Escape Personal-Social Pressure

1. Tension Release
   (I) a. Releasing clutched-up feelings.
   (I) *b. Releasing or reducing some built-up tensions.
2. Slow Down Mentally
   (I) a. Having your mind move at a slower pace.
   (I) *b. Giving your mind a rest.
3. Escape Role Overloads
   (I) *a. Getting away from the usual demands of life.
   (I) b. Avoiding everyday responsibilities for awhile.
4. Escape Daily Routine
   (I) *a. Having a change from your daily routine.
   (I) b. Having a change from your everyday life.

Domain P: Escape Physical Pressure

1. Tranquility
   (I) *a. Experiencing tranquility.
   b. Experiencing solitude.
2. Privacy
   *a. Feeling isolated.
   b. Being alone.
3. Escape Crowds
   a. Being away from crowds of people
   *b. Experiencing more elbow room.
4. Escape Physical Stressors
   (I) a. Getting away from the clatter and the racket.
   *b. Being away from noise back home.

APPENDIX D (cont.)

Domain Q: Security

1. Social Security
   (I) *a. Being near considerate people.
   (I) b. Being with respectful people.

Domain R: Escaping Family

1. Escaping family.
   (I) *a. Being away from the family for awhile.

APPENDIX E

CLUSTER ANALYSIS RESULTS OF ATTRIBUTE ITEMS

Attribute items that clustered together using the ICLUST cluster analysis program. Classification of the item after the preliminary questionnaire results are in parenthesis: high positive (H+), moderate positive (M+), neutral (N), moderate negative (M-), high negative (H-).

Clusters	Cluster Reliability
Bighorn sheep (H+) Beaver (M+) Few signs in the wilderness (M+) Slow-moving streams with deep holes (M+) Lakes with no trails to them (M+) Boulder fields (M+)	.685
Seeing domestic livestock (M-) Meeting a party of six or more on horseback (H-) Long strings of pack animals (H-)	.740
Knowing where the crowded areas of the wilderness are (M+) Knowing the regulations that govern an area (M+)	.275
Shortcut trails between switchbacks (M-) Deeply eroded trails (H-) Firerings at campsite (M-) Campsites that are close together (H-) Dead vegetation around campsites (M-) Seeing stripped or damaged trees (H-)	.963
Bridges over dangerous stream crossings (M+) Trail signs with destination mileages (N)	.611
Briefly chatting with others at your campsite (N) Long conversations with others at your campsite (M-) Gently rolling topography (M+) Briefly chatting with others on the trail (N) Accurate maps of campsites (M+)	.651
Brightly colored equipment (H-) Evidences of forest fires (M-) Rock slides (N) Well-maintained trails (N) Camping within sight of 1-2 parties which are out of hearing range	.707

APPENDIX E (cont.)

Camping with no one in sight (H+)	.558
Someone walking through your campsite* (H-)	
Considerate people (M+)	
Seeing no one else, except the members of your group for 2-3 days (H+)	
Not meeting any other groups during the day (H+)	
Pets on leashes (M-)	

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*This item clustered netatively with this primarily social attribute grouping because of the directions on the questionnaire. These required negative attributes be given 100 points for the worse item.

APPENDIX F

PSYCHOLOGICAL OUTCOME CLUSTER CORRELATIONS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Meeting Observing New People	1.00													
Autonomy-Achievement	.06	1.00												
Introspection	.18	.47	1.00											
Relationships with Nature/Scenery	.01	.27	.30	1.00										
Exploration	.10	.53	.31	.49	1.00									
Escape Social-Physical Pressure	-.01	.58	.52	.51	.58	1.00								
Being with Friends/ Similar People	.51	.15	26	.14	.12	.08	1.00							
Privacy	-.19	.53	.28	.18	.20	.37	-.02	1.00						
Learn About Nature	.10	.45	.46	.56	.48	.42	.21	.30	1.00					
Leading Others	.55	.18	.26	-.01	.05	.10	.51	.06	.04	1.00				
Family Togetherness	.25	.06	.12	.15	.09	.12	.32	.04	.23	.14	1.00			
Exercise/Physical Fitness	.09	.47	.31	.30	.45	.32	.12	.21	.41	.08	.04	1.00		
Risk Taking	-.21	.22	.07	-.09	.08	.01	.07	.28	.04	.07	-.13	.09	1.00	
Skills/Learning	.18	.55	.24	.13	.13	.23	.11	.13	.35	.28	.09	.42	.40	1.00
	Meeting Observing New People	Autonomy-Achievement	Introspection	Relationships with Nature/Scenery	Exploration	Escape Social-Physical Pressure	Being with Friends/ Similar People	Privacy	Learn About Nature	Leading Others	Family Togetherness	Exercise/Physical Fitness	Risk Taking	Skills/Learning

APPENDIX G

MEANS, STANDARD DEVIATIONS, AND SAMPLE SIZES FOR INDIVIDUAL CLUSTER ITEMS FOR EACH TYPE OF MAROON BELLS-SNOWMASS WILDERNESS USER

	Type 1 N=34					Type 2 N=51					Type 3 N=34					Type 4 N=99				
	Cluster		Item			Cluster		Item			Cluster		Item			Cluster		Item		
	Mean	S.D.	Mean	S.D.	N	Mean	S.D.	Mean	S.D.	N	Mean	S.D.	Mean	S.D.	N	Mean	S.D.	Mean	S.D.	N
Relationships with Nature/Scenery	8.7	.5				8.8	.7				8.5	1.5				8.6	.5			
Viewing the scenic beauty			8.7	1.1	34			8.8	.5	51			8.5	.7	33			8.7	.7	99
Viewing the scenery			8.7	.6	34			8.8	.5	51			7.9	.9	34			8.6	.6	99
Enjoying the sounds and smells of nature			8.6	.6	34			8.6	.6	51			7.8	.9	34			8.5	.7	99
Exploration	8.2	.9				8.2	.8				7.2	1.0				8.3	.7			
Experience new and different things			8.0	1.0	34			8.1	1.0	51			7.0	1.2	34			8.3	.7	99
Having a change from daily routine			8.3	1.2	34			8.3	.9	51			7.4	1.2	34			8.3	1.0	99
Exercise/Physical Fitness	8.5	.6				8.0	.9				7.2	.9				8.2	.9			
Keeping physically fit			8.6	.7	34			7.9	1.0	51			7.2	1.1	34			8.2	1.0	99
Getting exercise			8.3	.8	34			8.1	1.0	51			7.2	1.1	33			8.2	.9	99
Learn About Nature	8.5	.6				8.0	.8				7.0	1.0				8.0	.8			
Learning more about things here			8.3	.8	34			7.8	1.1	51			6.5	1.4	34			7.8	1.2	99
Learning more about nature			8.7	.6	34			8.0	1.0	51			7.0	1.2	34			8.0	1.0	99
Study nature			8.3	.9	34			7.9	1.1	51			7.0	1.3	34			7.8	1.2	99
Being close to nature			8.6	.7	33			8.4	.8	51			7.5	1.0	34			8.4	.8	99
Escape Social Physical Pressure	8.0	.8				7.9	.6				6.8	1.0				7.9	.6			
Being away from the noise back home			8.4	1.0	34			8.4	1.0	51			7.2	1.3	34			8.2	1.0	98
Getting away from the usual demands			8.3	1.2	34			8.5	.8	51			7.2	1.4	33			8.4	.8	97
Releasing tensions			7.8	1.4	34			7.5	1.5	50			6.1	1.4	34			7.6	1.3	99
Experiencing the elbow room			8.1	1.1	34			8.0	1.1	51			6.8	1.4	33			8.0	1.1	99
Tranquility			8.4	.8	34			8.0	1.1	51			6.9	1.0	34			8.2	.9	99
Giving your mind a rest			8.1	1.1	33			8.2	1.1	51			7.1	1.4	34			8.1	1.0	99
Autonomy/Achievement	8.0	.9				7.2	1.0				6.4	1.0				7.5	1.0			
Being free to make your own choices			7.9	1.2	34			7.6	1.2	51			6.8	1.2	34			7.6	1.4	98
Being your own boss			7.5	1.5	34			7.1	1.6	51			6.3	1.5	34			7.0	1.6	99
Feeling your independence			8.1	1.1	34			7.5	1.4	51			6.5	1.3	34			7.9	1.2	99
Becoming better at it			8.1	1.1	33			7.3	1.4	50			6.5	1.2	34			7.7	1.2	99
Gaining a sense of self-confidence			8.3	.9	34			7.3	1.6	51			6.3	1.8	34			7.6	1.4	99
Learning what you are capable of			7.9	1.2	34			6.6	1.3	51			6.3	1.1	34			7.2	1.3	99
Privacy	8.3	.6				6.7	1.4				6.9	1.3				7.2	1.4			
Feeling isolated			8.3	.8	34			6.9	2.0	51			6.9	1.8	34			7.2	1.7	99
Being on your own			8.3	.8	34			6.6	1.9	49			6.8	1.3	34			7.2	1.5	99
Skills/Learning	7.6	.9				6.9	.9				6.6	.9				7.3	.9			
Testing and using your equipment			6.7	1.6	34			6.3	1.4	51			5.7	1.3	34			6.6	1.6	99
Testing your abilities			7.7	1.5	34			6.8	1.4	50			6.7	1.5	33			7.5	1.4	99
Getting to know the lay of the land			7.8	1.2	34			7.1	1.3	50			7.0	1.3	34			7.3	1.4	99
Experiencing the excitement			7.7	1.3	34			7.2	1.4	50			6.9	1.4	34			7.9	1.0	99
Developing skills and abilities			7.8	1.1	34			6.9	1.3	49			6.5	1.1	34			7.4	1.0	98

	Type 1 N=34					Type 2 N=51					Type 3 N=34					Type 4 N=99				
	Cluster		Item			Cluster		Item			Cluster		Item			Cluster		Item		
	Mean	S.D.	Mean	S.D.	N	Mean	S.D.	Mean	S.D.	N	Mean	S.D.	Mean	S.D.	N	Mean	S.D.	Mean	S.D.	N
Introspection	8.3	.6				6.4	1.2				5.8	1.0				7.1	1.2			
Thinking about the good times you have had in the past			7.7	1.3	34			6.1	1.8	51			5.5	1.6	33			6.7	1.5	99
Thinking about who you are			8.6	.7	34			6.1	1.9	50			6.2	1.1	34			7.2	1.5	99
Thinking about your personal values			8.6	.7	34			6.8	1.6	51			5.9	1.5	34			7.3	1.5	99
Family Togetherness	8.2	.9				8.3	.7				6.0	1.4				5.8	1.8			
Doing something with your family			8.3	.9	34			8.3	.8	51			6.2	1.5	34			5.8	1.9	98
Bringing the family closer together			8.0	1.0	34			8.3	.8	50			5.7	1.5	34			5.8	1.8	99
Being with Friends/Similar People	7.1	1.7				6.9	1.1				6.0	1.0				7.0	.8			
Being with friends			7.3	2.2	34			7.2	1.7	51			6.7	1.1	34			7.8	1.0	97
Being with others who enjoy the same things you do			7.3	1.9	34			7.4	1.4	49			6.6	1.3	34			7.6	1.3	99
Sharing what you have learned with others			7.3	1.8	34			6.7	1.8	51			5.8	1.6	33			6.8	1.2	97
Being with other members of your group			7.3	1.6	33			7.1	1.5	51			6.0	1.4	32			6.6	1.5	98
Teaching your outdoor skills to others			6.4	2.4	34			5.8	1.7	51			5.3	1.4	34			5.8	1.4	99
Risk Taking	5.4	2.3				4.1	2.3				5.0	1.8				6.4	1.5			
Taking risks			5.7	2.3	34			4.3	2.2	50			4.9	2.0	34			6.5	1.6	98
Chancing dangerous situations			5.1	2.5	34			4.0	2.4	51			5.0	2.0	34			6.3	1.7	99
Meeting-Observing/Being Near New People	5.8	1.6				5.3	1.3				4.8	.9				5.7	1.3			
Being near others who could help			6.0	2.2	34			5.6	1.8	51			4.9	1.6	33			5.8	1.6	97
Knowing others are nearby			5.7	2.0	34			5.7	1.5	51			5.2	1.0	34			5.8	1.5	96
Being near considerate people			7.1	1.7	34			6.5	1.6	51			5.8	1.6	34			7.0	1.6	98
Talking to new and varied people			6.1	1.7	33			5.3	2.0	51			5.0	1.5	34			5.9	1.9	99
Observing other people			3.9	2.4	34			3.4	2.0	50			3.3	1.6	34			4.0	1.8	99
Leading Others	5.0	2.3				4.3	1.3				4.8	1.2				4.9	1.5			
Helping direct the activities of others			4.8	2.7	33			4.1	1.7	51			4.7	1.6	34			4.7	1.6	99
Showing others you could do it			5.3	2.4	34			4.6	1.5	51			4.9	1.1	34			5.3	1.8	96

APPENDIX H

TABULAR RANKING OF ATTRIBUTE ITEMS FOR FOUR TYPES OF MAROON BELLS-SNOWMASS WILDERNESS USERS

Attitude Group	Ranking	Type 1*	Type 2*	Type 3*	Type 4*
Group 1 (high)	1	S	S	S	S
	2	S	M	S	M
	3	M	S	M	S
	4	P	P	M	M
	5	P	M	P	P
	6	M	P	P	P
Group 2 (high)	1	S	S	S	S
	2	S	S	S	M
	3	M	P	P	M
	4	P	M	M	S
	5	M	M	M	P
	6	P	P	P	P
Group 3 (moderate)	1	M	M	M	M
	2	M	M	M	M
	3	P	P	S	S
	4	S	S	P	P
	5	P	P	P	S
	6	S	S	S	P
Group 4 (moderate)	1	M	M	M	M
	2	M	M	M	M
	3	P	S	P	P
	4	P	P	S	S
	5	S	P	P	S
	6	S	S	S	P
Group 5** (negative)	1	P	P	P	S
	2	S	S	S	P
	3	P	P	S	S
	4	S	S	P	P
	5	M	M	M	M
	6	M	M	M	M
Group 6** (negative)	1	P	M	P	P
	2	S	S	S	M
	3	M	P	M	S
	4	P	M	P	P
	5	S	P	M	M
	6	M	S	S	D

*S = social item; M = managerial item; P = physical item

**Items ranked highest were the least desirable items in the negative groups.